AUG 15 1898

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Number 2.

AUGUST, 1898.

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With which is Incorporated the

INDUSTRIAL RECORD

The Textile World's Complete Directory of the Mill Trade and of Large Buyers of Textile Fabrics, for 1898, is now ready for delivery. It contains 400 pages, and 19 textile maps; several valuable new features have been added.

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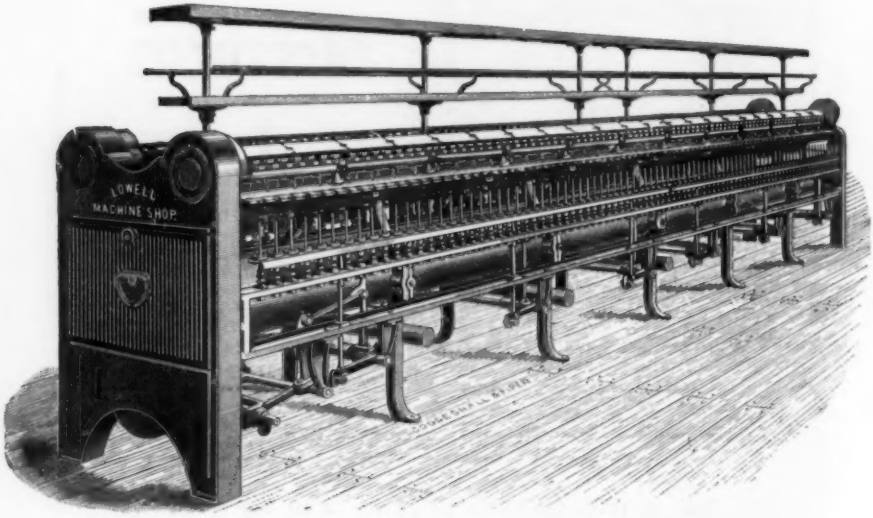

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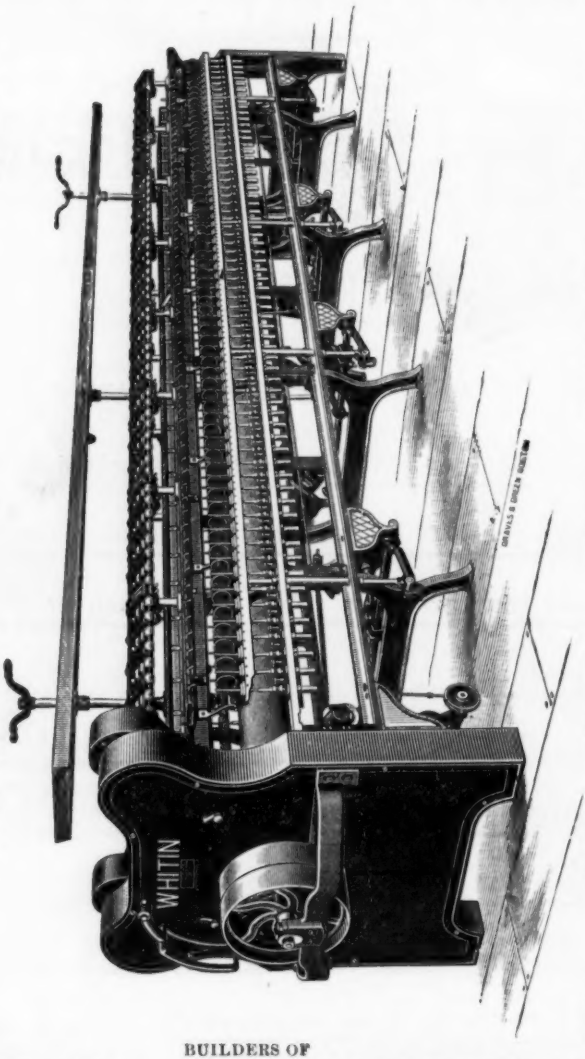

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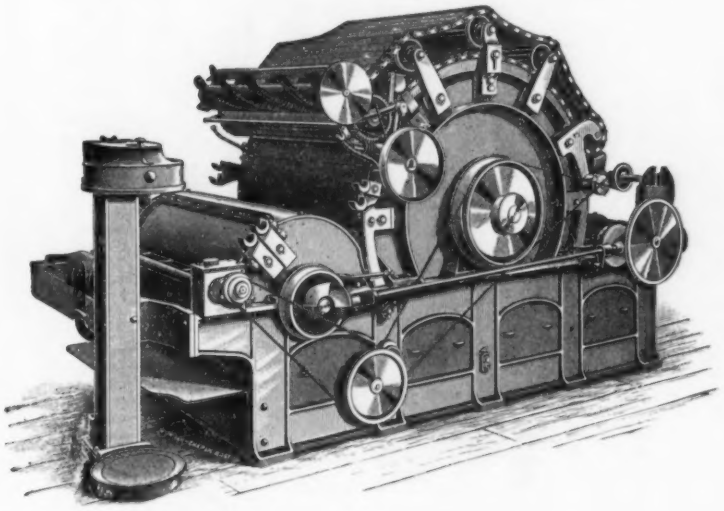

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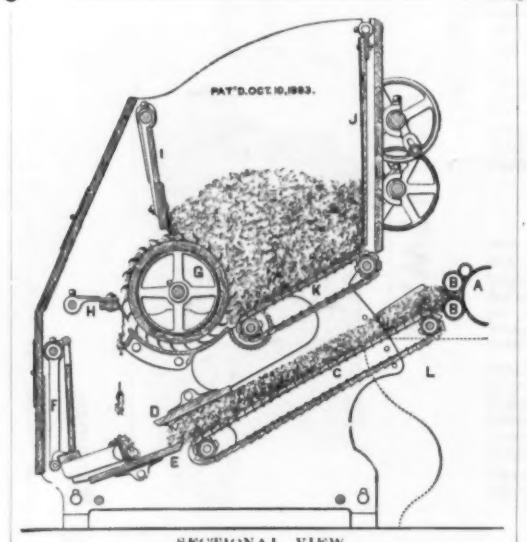

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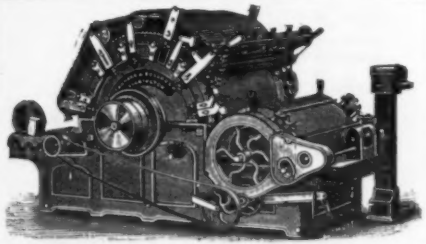

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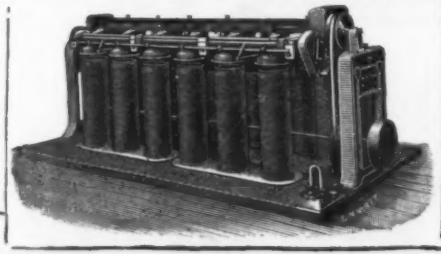

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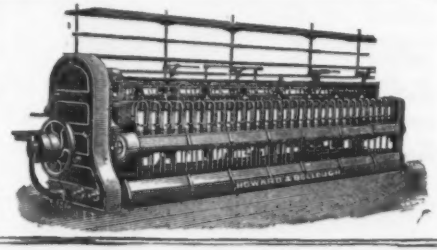

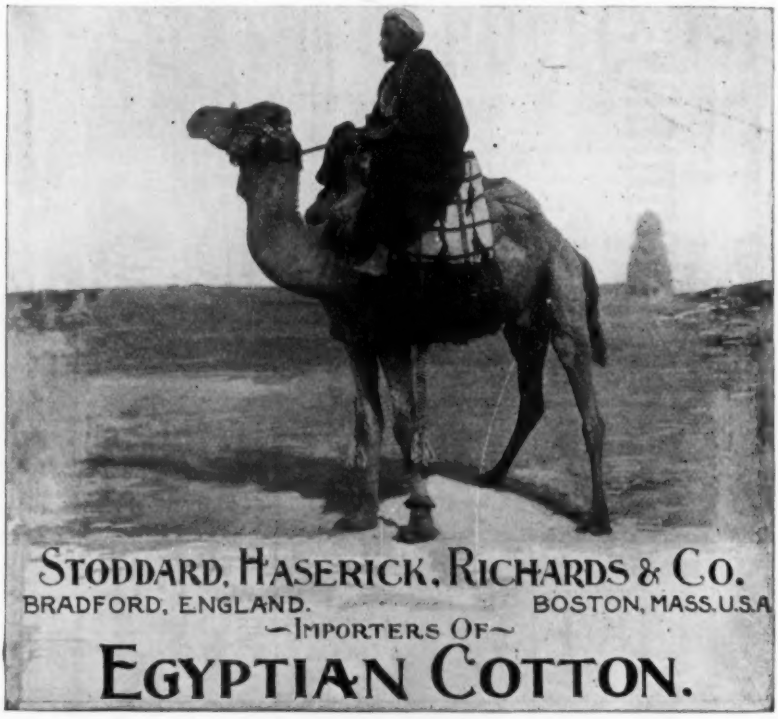

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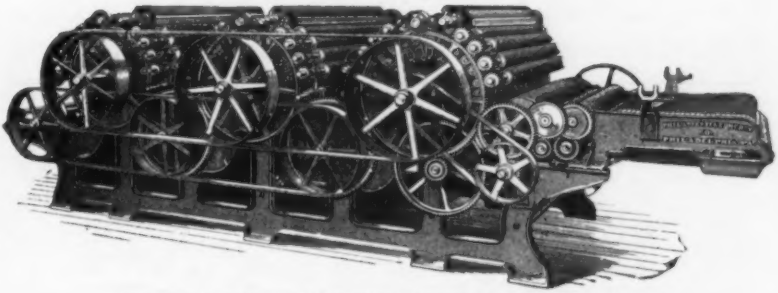

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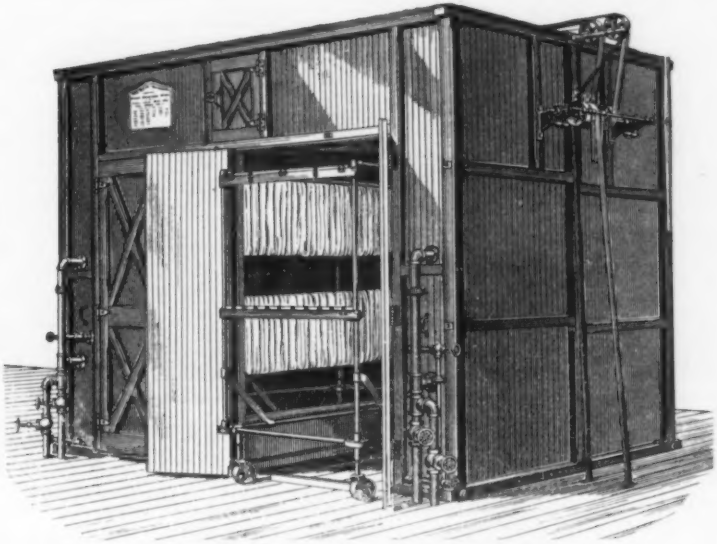

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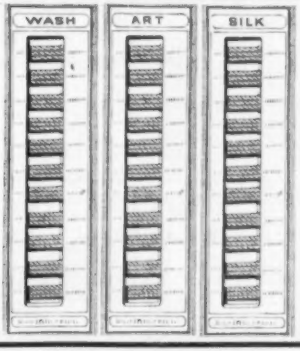

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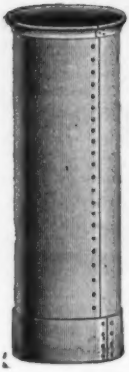

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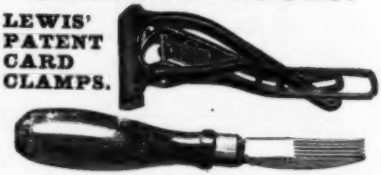

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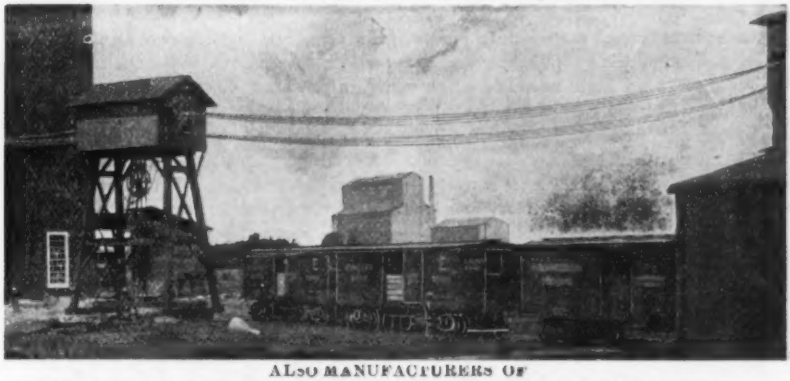

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Reform should begin with..... the Bale.

Every cotton manufacturer recognizes the very great importance of an improved system of baling, but he may fail to appreciate how he can help the reform movement. He thinks he must take his cotton in any shape it comes to him. This may be true for a time, until the planter is brought to see that the manufacturer's interests are identical with his. Let every manufacturer, when buying, emphatically state his preference for such a bale as the Lowry press makes, and a tremendously powerful influence is created which cannot fail to expedite the desired end.

Other efforts along this line, in the way of a round bale, have met with only meager success because the presses were complicated and expensive and the plans adopted savored too much of monopoly.

The Lowry press is so simple and comparatively inexpensive that every gin in the South can have one. It is not to be controlled by a syndicate, but every planter may buy it. There need be no revolution in the methods of the cotton trade to introduce the Lowry bale, which possesses such manifest advantages that every one who saw it at the spring meeting of the New England Cotton Manufacturers most heartily approved of it.

THE LOWRY COTTON BALE.

The bale on end is the Lowry bale with the covering on. The bale on its side is the Lowry bale with the covering off, but the wires uncut. The long caterpillar coil is the Lowry bale after the wires are cut.

It opens spontaneously upon cutting the binding wires, and contains no felted or matted cotton, and almost no tare.

This press and bale can and will be brought into general use, and offer the only practical means towards the reform of the slipshod American system of baling. The saving in freight, insurance, tare, and condition of stock presents an unanswerable argument, about which cotton manufacturers can have but one opinion. Therefore let that opinion be known whenever opportunity presents itself. Ask for the Lowry bale.

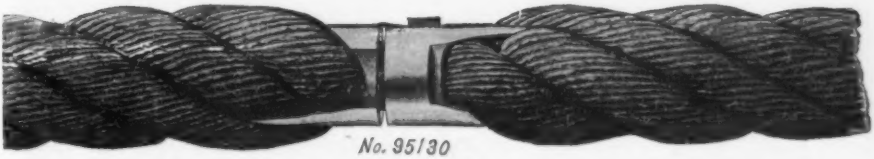
Any who are interested in learning more about it and the press are invited to address the

PLANTERS' COMPRESS CO.,

89 State St., Boston, Mass.

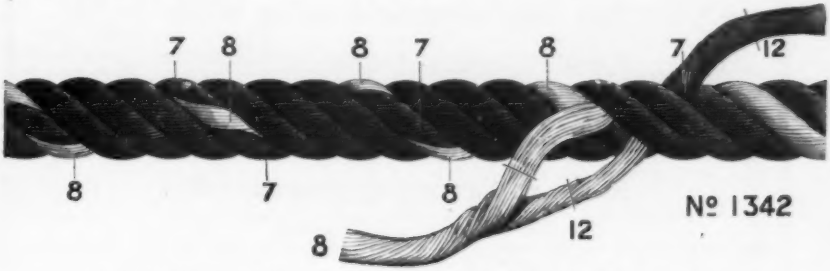
STEPHEN M. WELD, President.

Rope Transmission.



HUNT ADJUSTABLE COUPLING FOR SHORTENING THE LENGTH OF THE ROPE WITHOUT RESPLICING

THE C. W. HUNT COMPANY make a special rope from selected manila fibre, and known under the trade name of "Stevedore." This rope is of one quality only, and from the finest selected cut manila stock. Two kinds are made, one for the transmission of power, the other for hoisting purposes. Particular care is taken to have the twist of the threads and the lay of the strands exactly suited to the kind of work to be done by the rope. A plumbago lubricant is used in laying up this rope, which reduces the internal friction of the fibres on each other in bending over the pulleys, and also makes the rope



THE CORRECT WAY OF MAKING A TRANSMISSION OR HOISTING-ROPE SPLICE. CATALOGUE HAS FULL DIRECTIONS.

so nearly water-proof that it absorbs only a slight amount of water when exposed to a heavy rain in an outdoor transmission, while ordinary rope is not durable when exposed to the elements. Constructing the rope of the best material only, makes it cost more than ordinary manila rope; but we **guarantee** it to do more work in proportion to the cost than any other rope, whether manila, cotton, or other fibre, without any exception whatever, thus making it the cheapest rope that can be used, when service is considered.

Our Catalogue, "Manila Rope," contains a brief treatise for engineers, together with formulæ, tables, knots, and other useful data.

C. W. HUNT COMPANY,

BARD AVENUE,

Staten Island, N. Y.

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This is particularly true of Black, in the past a most troublesome color.

Alizarine Black can be recognized by the acid test.

Wm. Pickhardt & Kuttroff

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PATENTS

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George W. Gregory, in November, 1874, resigned his position as Principal Examiner U. Patent Office to enter the firm.

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HOPEDALE, Mass., January 2d, 1896.

Mr. George W. Gregory, of Crosby and Gregory, has taken out for us since January, 1875, more than two hundred patents. GEO. DRAPER & SONS.

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Mr. Van Everen, of our office, was for a number of years an Examiner in the U. S. Patent Office, in the Division of Textiles.

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Adams Building, 23 Court St., Boston.

List of Textile Patents.

Issued June 28, and July 5, 12, and 19, 1898.

Specifications and drawings furnished for ten cents each, Address W. S. Gavey, P. O. Box 222, Brooklyn, N. Y.

Drawing Rollers. Shield or Deflector for. 607,724. Thomas Wolstenholme, Philadelphia, Pa.

Dye, Blue. 606,436. Fritz Bender, Muhlheim, Germany, assignor to Farbwerk Muhlheim, vormals A. Leonhardt & Co., same place.

Dye, Blue Black. 606,438. Fritz Bender, Muhlheim, Germany, assignor to Farbwerk Muhlheim, vormals A Leonhardt & Co., same place.

Dye, Green Disazo. 606,439. Fritz Bender, Muhlheim, Germany, assignor to Farbwerk Muhlheim, vormals A. Leonhardt & Co,, same place.

Dye, Yellow, Brown Cotton. 606,193. Robert Demuth, Elberfeld, Germany, assignor to the Farbenfabriken of Elberfeld Co., New York.

Card, Clothing. Device for Bending Teeth in. 606,829. Edward Whittaker, Methuen, Mass.

Holland and Colonies.

Patents. Trade Marks.

H. Massink, L. D. at Amsterdam.

Cotton Press. 607,063. Charles E. Mallet, New York, N. Y.

Combing Machine. 607,643. Eugene Delette, Lure, France.

Fabrics. Process of producing white effects on. 606,776. Stewart F. Carter, North Adams, Mass., assignor to the Windsor Co , same place.

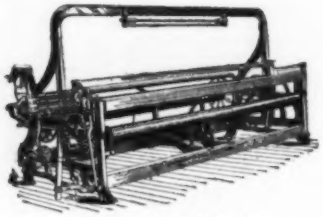
Fabrics. Process of producing white effects on. 606,777. Stewart F. Carter, North Adams, Mass., assignor to the Windsor Co., same place.

Fabrics, Turfing Implement. 606,707. Matthew F. Connett, San Antonio, Texas, assignor to Layton Y. Hancock, same place.

Knitting Machine. 607,002. Robert W. Scott, Philadelphia, Pa., assignor of one-half to Louis N. D. Williams, Ashbourne, Pa.

(Continued on next page.)

M. A. FURBUSH & SON MACHINE CO.



Blanket Loom, No. 128.

A WORD ABOUT LOOMS.

We have been loom builders for nearly 50 years. The name of Furbush is closely associated with the developement of the woolen loom in this country, and in the carpet trade our Murkland loom is u-ed wherever the ingrain carpet is made. We also make a specialty of looms for rugs.

But don't forget that we build other looms, notably blanket looms, and other looms for heavy goods, also narrow looms.

Our pattern No. 128 is a strong, substantial loom of best material, and adapted, with modifications, to weave blankets, table covers, paper makers' felt and heavy cloth.

Our standard widths are 49, 92, 100 and 115 inches, reed space.

Particulars of a loom 115 inches in the reed space: Revolutions to pick, 2; picks per minute, 80; h. p., 1; floor space, 15x5 feet; weight, 2,300 pounds.

CARDING, SPINNING AND WEAVING MACHINERY.

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Knitting Machine, Circular. 607,793. Daniel Hurley, Bennington, Vt., assignor to Charles Cooper, same place.

Knitting Machine, Circular Warp. 606,351. Arthur E. Lindner, Wilmington, Del., assignor to Julius Kayser, New York, N. Y.

Knitting Machine, Circular Warp. 606,352. Arthur E. Lindner, Wilmington, Del., assignor to Julius Kayser, New York, N. Y.

Knitting Machine, Circular Warp. 606,353. Arthur E. Lindner, Wilmington, Del., assignor to Julius Kayser, New York, N. Y.

Knitting Machine Needle. 607,253. Robert L. Lyons, Waltham, Mass., assignor to Union Button Sewing Machine Co., Boston, Mass.

(Continued on page 126.)

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FIRE PROOF, STRONG, LIGHT, PERMANENTLY FLEXIBLE, EASILY APPLIED.

These words describe briefly our line of **ROOFING** and **FELTS**. We have a variety of styles and prices.

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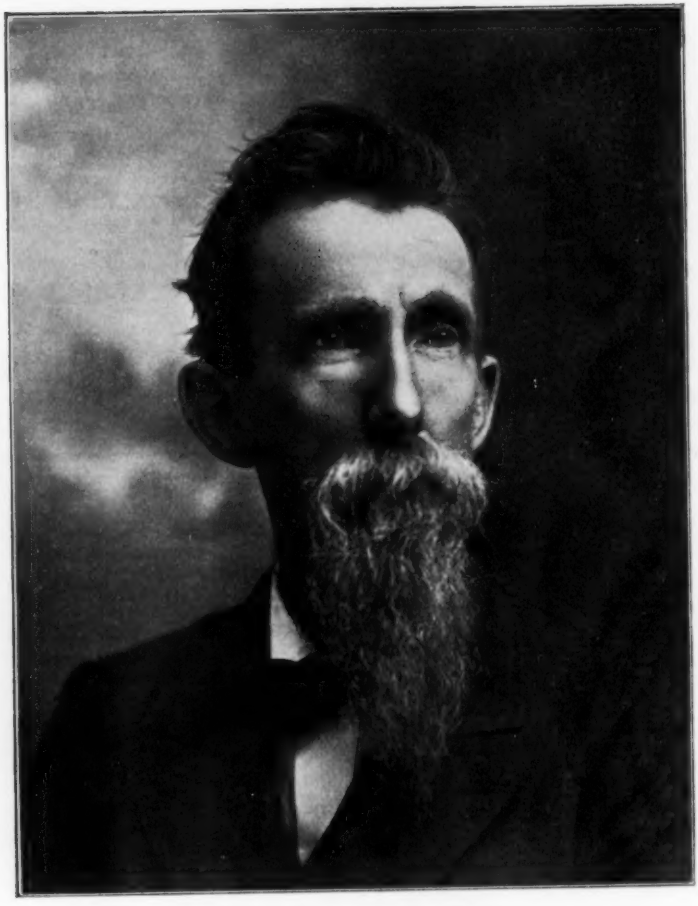

OTIS G. LYNCH.

TEXTILE WORLD.

Vol. XV. AUGUST, 1898. No. 2.

OTIS G. LYNCH.

The subject of this sketch was born in Otsego County, New York, July 10, 1833, and commenced work in a cotton factory at the age of eleven years. He attended a night school and also had the advantages of the district school at different times during the next three or four years. Suction fans and dust flues were then unknown and in the winter season the doors and windows of the picking room where he first worked were so tightly closed that the dust made it almost suffocating. The help were required to be on hand at the mill at 5 o'clock in the winter time, light being obtained from lanterns, while in the summer time work was commenced as early as daylight with one-half hour allowed for breakfast and the same length of time for dinner, quitting work at 7.30 in the winter and at dark in the summer. In time, Lynch was promoted to run a batting card and then became back boy on a pair of hand mules. When the hand mules were soon after displaced by self-operators, he became a front piecer, and was able to operate the mules at the age of 15, and did most of the work required on these machines or on the flyer frames. He also, at leisure moments, assisted in the company's store, worked in the cloth room, helped to cover rolls, make size, etc. When he attained the age of 15, he was made secondhand in a spinning room in a mill in Oneida County, New York, and at 17 was placed in full charge of it.

Business in 1853-1854 was bad, and the running of small and poorly-equipped cotton mills at a profit was almost impossible. As a consequence, the small mill where Lynch was then working was shut down, which threw him out of employment. The South, even then, had been talked and written about as a successful manufacturing section and as a possible future competitor of the North. Lynch concluded to try his fortune in the South, and, in 1854, went to Augusta, Ga., but found the two mills located there in a not very prosperous condition, with only one of them in operation. He tried Columbus, Ga., where several mills were located, but not succeeding in securing employment, returned to Augusta and obtained a job as a roll coverer in one of the cotton mills there, but was soon put into the spinning department; and although he has at various times had charge of other departments, it was as a spinner that he proved himself most successful.

Francis Cogin came to the Augusta Factory, Augusta, Ga., as general manager in 1859, and under him Mr. Lynch had charge of the spinning for more than 20 years. This mill was peculiarly situated during the war but under what seemed unsurmountable conditions, was put and kept in a splendid state of repair and efficiency, and after the war was over, was for many years able to make and declare dividends, which at this time would seem almost fabulous.

In 1880, Mr. Lynch accepted the position of superintendent of the Enterprise Manufacturing Co., in the city of Augusta, which, at that time, had 6,560 ring and 7,332 mule spindles, and 264 looms. The mill was enlarged in 1881, to 600 looms with a proportionate quantity of other machinery. Its success warranted a further enlargement in 1888, to its present capacity of 32,432 ring spindles and 928 looms.

This last enlargement was made from the earnings of the mill after paying fair dividends to stockholders.

Mr. Lynch has ever been accounted a public-spirited citizen, ready at all times to assist, to the extent of his ability, in every measure which has for its object the welfare and prosperity of his country, section and city. He is at the present time a member of the Board of Education of Richmond County, Georgia. He has maintained for many years at the mill, a school where the children of the operatives are taught free throughout the year. He has for a long time been actively identified with the masonic fraternity and has acceptably filled most, if not all, of the offices in the lodge, chapter and commandery.

Mr. Lynch is widely known as one of the most enterprising and successful cotton manufacturers in the South.

UNDERWEAR FOR THE ARMY.

The soldiers of the United States army are much better clad now than they were during the civil war. Much was learned from the experiences of those times, from which many improvements have been made for the health and comfort of our soldiers. It is only since then that the government has provided any underwear. At that time, all such clothing had to be obtained at the expense of the wearer. The government now supplies a complete outfit in the clothing that is needed, leaving nothing for the soldier to obtain himself.

The outside blue flannel shirts were furnished during the civil war, and since, but the workmanship is now superior to what it was formerly. The color must be of indigo or alizarine blue, or five per cent. of the latter and 95 per cent. of the former.

The supplying of knit goods is comparatively new, although the shirts have been in use for a longer time than the drawers. It has not been, until the present war with Spain, that the soldiers have been furnished with knit drawers. Heretofore, jean drawers alone have been supplied. The present requirements for knit underwear were adopted in 1894. The undershirts and drawers are required to be made of good cotton, and knit on a 20-guage machine; weighing, according to sizes, from seven to nine and a half ounces for the shirts, all white. Experience has shown that a 20-guage knit under-garment is the best for army purposes. The bids to supply the army with such underwear have been on about the basis of 25 cents per shirt, and about the same for drawers.

PUERTO RICO.

The island of Puerto Rico is, for all practical purposes, a part of the United States, wrenched from Spain as a conquest, partly in lieu of a money indemnity for our war expenditures. The value of this island to us, of course, excites interest, and in order to meet this want of intelligence, the government has issued a pamphlet showing the commerce of this island. From it, we note that its foreign trade, in 1896, amounted to $36,624,120, just about enough to meet one month's war expenditures of the United States. About eighteen million dollars of this was represented in the value of the imports, and it is the revenue which we can derive from this source which will give us an idea of the real value to us of our possession of the island. Assuming that there is no increase in the value of imports, our revenue from them would amount to about six million dollars a year; but, there is every reason to suppose that the value of the imports will rapidly increase, and that by the end of the next ten years they will reach in the neighborhood of fifty million dollars, returning a revenue of nearly fifteen million dollars a year. This is a conservative estimate of the increase, reckoned upon that for the last ten years under the Spanish government. The character of the imports of merchandise in Puerto Rico has heretofore been mostly non-agricultural, while that of the exports has been chiefly agricultural. Cotton fabrics are the principal articles of import, while coffee, sugar and molasses constitute the chief articles of export.

Textile World

WITH WHICH IS INCORPORATED THE

INDUSTRIAL RECORD,

COMBINING

THE AMERICAN TEXTILE, THE DESIGNER AND WEAVER, WARP AND WEFT, THE WOOLEN MANUFACTURER

AND THE

BOSTON TEXTILE.

An Illustrated Monthly Magazine representing the Textile Industries of the United States.

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THE TEXTILE WORLD'S COMPLETE DIRECTORY OF THE TRADE.

(400 pages with 19 maps)

Containing full information about all

COTTON MILLS, WOOLEN MILLS, KNITTING MILLS, SILK MILLS, DYE WORKS, PRINT WORKS, BLEACHERIES,

also lists of

Dry Goods Commission Merchants,
Dealers in Raw Materials,
Manufacturing Clothiers,
Suit and Cloak Makers,
Jobbers and Large Retailers,
Buyers from First Hands.

Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

THE SPANISH-AMERICAN WAR.

With the defeat of Cervera's fleet and the fall of Santiago, the signs of peace were apparent to all who had followed the progress of events in the Spanish-American war. The principal factor the United States has been obliged to contend with, in its relations and attitude toward Spain, has been the historic and sentimental pride of the Spaniards, and particularly those who are in the exercise of power. Spain has fought with pride, passion and ignorance back of her. These have been her impelling force and the source of her impetus. She has deliberately and with subtle purpose deceived her people in regard to her own prowess, and the wealth and military resources of her antagonist. The Spanish people have been lied to with persistency by their government, in respect to the disasters which have befallen their navy and army.

With the terrible defeats that she has met with by water and by land, Spain is now in a receptive mood to consider terms of peace, and has asked the government of the United States, through the French minister at Washington, for terms by which the war can be brought to a close. These terms have already been transmitted to the Spanish government for its acceptance or rejection. Territory and privileges alone are asked, no war indemnity is demanded. This latter would have been useless, because Spain has nothing to pay with, being practically bankrupt, with the prospect that she will be obliged to repudiate a portion of her debt and settle with her creditors upon a basis of the market value of her bonds, held by financiers in Paris and elsewhere.

On the whole, it will probably be of more advantage to Spain to be defeated than if she were victorious, as more modern methods of government will likely be instituted throughout the kingdom and the people elevated above their present benighted condition, as a policy for national existence.

That Cuba should receive its liber-

ties is one of the primary, if not the leading, conditions of peace. What its liberty will consist of, it is impossible at this time, to say, as this question will be left for determination to the more intelligent classes of the island. It may eventually lead to annexation to the United States, but this is a matter which should receive no guidance or suggestion from this country, but be left entirely to the volition of the inhabitants of Cuba. Puerto Rico becomes a part of the United States as a conquest, and its commercial importance will advance more rapidly than ever before.

Territorial extension, or colonization, has heretofore been conducted for trade or plunder, and never before for the amelioration of humanity. The United States stands alone in this respect, in conducting the present war upon the highest principles, for the good and advancement of mankind. The United States has entered upon a new era for itself, in the mission of civilization. England has been pursuing the same ideal in the extension of her political and commercial influence. We have been brought to a keener realization of the westward progress of the Aryan race, that commenced more than two thousand years ago, in eventually encircling the world, to its original home. It has already nearly reached its final goal, with its Teutonic division, lead by the Anglo Saxon branch, in the van. The English speaking people are pioneering the way, having already entered the Mongolian Empire, with the United States bridging the Pacific Ocean, from San Francisco to the Philippine Islands.

The most vexing question that our government will have to contend with, is the disposition to be made of our successes in the Philippine Islands. As a stragetical, naval and commercial proposition, it seems as a foregone conclusion that we should have, at least, a coaling station in that part of the world. It is far more important now than formerly, when the sail was depended upon more than steam for navigation. These islands and their inhabitants are not yet fully known. But few of the islands have as yet been fully explored, and the interior of some of the larger ones not surveyed, though Spain has been in their possession for over three centuries. The island of Luzon, upon which Manila is situated, is the best known, still, much ignorance exists as to its geology, fauna and flora. The islands extend north and south a distance equal to that from our great lakes to the gulf of Mexico. The present population consists mostly of Malay extraction, their occupation of the islands being the result of conquest over the natives. Their religion is mostly Roman Catholic, with native superstition, subservient to a debased priesthood, in which respect they are immeasurably worse off than the people of Cuba. It will become a serious question whether the United States will feel that its interests lie in attempting the civilization of this people and the eradication of the demoralizing conditions that have arisen from a corrupt administration of public affairs. At the present time, it looks to the general reader as if we might have serious trouble with the natives, should we attempt to bring them under the restrictions and control of laws governing civilized nations. President McKinley is apparently waiting to be guided in his policy of administration according to the views of an enlightened people. This is a spectacle that is grand indeed, in the confidence manifested in the wisdom of an intelligent community of freemen, capable of appreciating the evidence of events and their effect upon the national welfare.

LINEN MANUFACTURING.

The manufacture of linen goods in the United States is purely tentative at the present time, and the attention of manufacturing communities has been attracted to this industry because of the depression that has existed in the textile industries in general and cotton manufacturing in particular. The use of linen yarn appeals

more directly to the cotton than to the woolen mills, as it requires but little change in the weaving and finishing machinery of the former. It is impossible to predict what the future will be affecting the linen manufacturing industry in this country. The use of flax will come in more direct competition with cotton than anything else, and the manufacture of cotton fabrics can be conducted at such a low cost that the linen industry will find it extremely difficult to contend with.

Recent efforts have been made, experimentally, to see what can be done in the manufacture of linen fabrics. The incentive to this is due largely to the protection that is afforded by our tariff against foreign competition. The flax schedule of the tariff was framed with the direct purpose of encouraging linen manufacture in the United States, to the extent of placing a relatively lower duty upon fine spun, single yarn used for such a purpose, than upon the coarser single yarns. For instance, the duty upon single yarn, from No. 8 to No. 80, is 40 per cent. ad valorem, and on yarn finer than No. 80, 15 per cent. ad valorem. It is the finer yarns that are wanted for weaving purposes. This distinction was generally acceptable and agreeable to the linen yarn manufacturers, who recognized the importance to their own industry of inducing the manufacture of woven fabrics, and thus creating a larger demand in the future for their own product. For the time being, the flax yarn mills of this country are content with spinning coarser yarns than No. 80, and, in fact, No. 30 and under. Nothing, probably, will be accomplished in the manufacture of woven linen fabrics, except the coarser grades, for, at least, the next ten years. We have seen some excellent examples of table cloths and napkins made from flax yarn, effecting in kins made from flax yarn, effective in their design and finish, but, coarse compared with our foreign importations.

The 1890 census devoted but little attention to the statistics relating to flax manufacture, and furnished but little satisfactory information concerning the status of the industry at that time. It appears, however, from the figures that can be gathered from the census, that in 1890 there were employed in the dressing of flax, 517 employees, who turned out a product valued at nearly one million dollars. In the manufacture of linen goods, there were employed at that time, 583 persons, in producing a product valued at about $550,000. The statistics pertaining to the manufacture of linen threads were seemingly of so little consequence that they were thrown in with those relating to "all other industries." The tariff of 1897 has had an effect upon curtailing the importation of manufactures of flax. For the fiscal year of 1896-97, the importation of flax and tow amounted to 7,480 tons, and of hackled flax, 1710 tons. For the ten months ending April 1898, the amount of flax and tow imported was only 1779 tons, but of hackled flax, (2576 tons), there was an increase. The importation in 1896-97, of goods made from vegetable fibres, mostly flax, amounted to over 20 million dollars, while for the ten months ending last April, such importations amounted to less than twelve million dollars.

There are 44 flax mills enumerated in this country, but, strictly speaking, they are not manufacturing establishments, as many of them are devoted simply to the making of flax tow. These are located principally in the West, as in Indiana, Iowa, Kansas, Kentucky, Ohio, and Minnesota, most of them being in the latter States. A small effort is made in Iowa to manufacture flax cordage; in Minnesota, a low grade of crash towels and twine, the latter by the convicts at the State prison; in Wisconsin, crash goods and terry cloth; in Kentucky, twine; in New York, there are two concerns on twine, thread and yarn; in Ohio, one on twine; in Pennsylvania, chiefly in Philadelphia, there are concerns engaged in the manufacture of fishing lines, twine, yarns, and low grades of fabric. The principal manufactures of flax are those of mills in Massachu-

setts and New Jersey. Most of the capital is invested in these two States, in the manufacture of threads, yarn, twine, crash goods, etc. No fabrics, we believe, are made of any consequence outside of a few cotton mills that have taken it up as a sort of relief to their cotton manufacture. A flax mill was started sometime ago in South Dakota, but its machinery has been sold. In New Hampshire, an effort was made to make linen absorbent, but the concern that entered into this industry is not in operation. There is a small concern in Missouri, but its existence is uncertain.

MILL RENOVATION.

The general depression in textile manufacturing, especially in the cotton and woolen branches, together with recent conspicuous failures, have again drawn attention to the management and mechanical equipment of mills in the general race for the "survival of the fittest." Everything now is on a comparatively low-cost basis, obtained through the reduced value of the raw material and an increased production of machinery, without decreasing the earning capacity of employees. It is recognized as being false economy to reduce the earning power of the laboring class, as consumptive demand largely depends upon its financial status. Prosperity, therefore, has to be practically dependent upon economical methods and devices. Machinery becomes antiquated long before its parts become impaired by use. Machinery is seldom worn out, but superseded by improvements, which makes it useless as a manufacturing agency to meet competition.

The recent failure of a prominent Providence concern, engaged in the manufacture of cotton goods, has directed attention, anew, to this matter, their failure being due principally to the out-of-date machinery that was employed in their mills, and the competition which they were obliged to meet with concerns of larger producing capacity. Two factors entered into their failure—antiquated machinery, and low producing capacity. The concern simply rusted out.

The introduction of new inventions, especially in the weaving department, has made it incumbent on cotton factories, in particular, to make radical and costly changes, in order to meet competition and reduce cost, brought about by these new devices. Fall River is particularly affected by these inventions, and one of the large mills in that city has come to the conclusion of making a complete change in its weaving department, to meet new conditions. We are authentically informed that the Bourne Mills, of that city, have already contracted for the substitution, for their entire weaving plant, of the Northrop looms for their old looms. This means a change of fully 1300 looms, and is the first considerable movement in this direction. To what extent the other mills will follow, we are unable to say at this moment; but if undertaken, it would involve a large expenditure of money. It practically affects 50,000 looms in Fall River alone, the changing of which would probably call for an outlay of five to seven and a half million dollars. It, therefore, becomes a serious financial problem, but one, we are inclined to think, that will have to be met, not only by Fall River mills, but those in like situation. We do not know if the Northrop loom will be adopted in all cases, but some change in lessening the cost of weaving, will have to be made.

Woolen mills are really in a worse condition that the cotton mills. There is more out-of-date machinery in the former than in the latter. In fact, it is astonishing, upon investigation, to find so much antiquated machinery in the woolen mills as is now running, not only in the Western States, but right in New England, where everything is supposed to be kept up to date, in the way of improvements and progressiveness. There is some machinery in Massachusetts working on fine goods, that was built more than sixty years ago. It is not the quality that concerns the manufacturer, that these

machines can produce, so much as the quantity that can be turned off. Two essential elements must be taken into account—quality and quantity. One is as necessary as the other. All of the failures in cotton and woolen mills are not due to out-of-date machinery entirely, but we have recent instances of failures traceable to such a condition. A cotton mill in South Carolina has failed, because of its not keeping up with the times. Two woolen mills in New York have been recently sold by the sheriff, or under orders from a receiver, for the same cause. A cotton mill in New York has also met the same fate.

COTTON CULTIVATION.

The cost of raising cotton is still an unknown and undefined factor in Southern agriculture. According to the best figures that can be obtained from prominent cotton growers, the cost of raising cotton is somewhere in the neighborhood of six cents per pound, varying, of course, upon the fertility of the soil and incidental expenses. We believe that the opinion is now growing that cotton can, under favorable economical conditions, be raised so as to be a sufficient inducement for farmers to engage in it, at a cost of 3½ cents per pound. This we have alluded to at different times. There is seemingly no question but that intensive farming is the proper method to pursue in all agricultural operations. Two things, at least, must be adhered to, and these are the proper selection of seed for planting and the keeping up of the fertility of the soil. In order to do the latter, a judicious use of fertilizers is required.

There are really no exact statistics to be had concerning the amount of fertilizers that are used for agricultural purposes in the South, the nearest approach being the statistics given by the Department of Agriculture, Washington. According to the latest statistical reports of this department concerning the amount of commercial fertilizers consumed in the Southern States for all purposes, (more largely, it is presumed, for cotton), show that the free use of fertilizers has resulted in an increased production of cotton per acre. For instance, it is noted that a consumption of fertilizers in the cotton growing States of 835,000 tons, in 1891, resulted in the production of a crop of over nine million bales. In 1892, a decreased use of fertilizers (690,000 tons), resulted in a crop much less than seven million bales. A decreased use of fertilizers in 1895, as compared with 1894, resulted in a decreased production of cotton of 28 per cent. The current season's crop of cotton, that will amount to over eleven million bales, is largely due to an increase in the amount of fertilizers used, as compared with any previous year.

Over a million tons of commercial fertilizers were consumed in the Southern States in 1897. It has been statistically demonstrated that by the expenditure of less than $10 per acre for fertilizers, an average increase in the profits of raising cotton of about $13 per bale, will be the result, or over 2½ cents per pound. Of course, fertilizers should be used judiciously, with reference to the character of the soil, etc. There is such a thing as too free a use of it, resulting in the "burning" of the plant and a decreased yield.

PROFIT SHARING.

We do not know of any manufacturing establishment that has been more successful in carrying out the idea of profit sharing with employees than the Bourne Mills, Fall River, Mass. The eighteenth semi-annual dividend, under the profit sharing system, was paid last month; about eighty per cent. of the employees receiving a share, the largest proportion since the scheme was inaugurated, nine years ago. The dividend amounted to two per cent. of the wages earned between December 12, 1897 and June 11, 1898, that is to say: If an employee earned $200 during this time, he received an additional $4. This dividend was the

smallest that was ever paid, due to the depression that has affected the trade.

Profit sharing, as conducted by these mills, has passed the experimental stage, and is regarded, we believe, by the officials, as something permanent, as a part of the financial administration of the corporation. The scheme was first started as an expression of the good will of the mills towards their employees with a hope that it might result in mutual benefit, and it has proved so. The board of directors of the mills have always been conservative and cautious in respect to the practical features of the plan. Short terms for a division of profits were at first entered upon, as a matter of prudence. Notwithstanding some disadvantages connected with a short term in place of a long term, there is a benefit derived from it in the fact that it gives the employees their money at shorter periods, for saving or spending, as they may see fit. The principles of the mills' plan of profit sharing are very simple and easily understood, the essential point being that every employee, man, woman or child, who continues faithfully at work during any term, is entitled to a share of the profits, and that the employees shall share in proportion to the dividends declared and paid to the stockholders, and that the share shall be a dividend upon the wages earned during the specified term. The plan capitalizes the interest of the employees in the mills at the most they can earn during a period of six months. A rate of dividend is calculated by dividing a certain per cent., not less than six, nor more than ten, of the amount paid to the stockholders, by the total wages, and then the amount of each individual's wages is multiplied by this rate, for each one's share.

To give an idea of the dividends that have actually been paid, it may be stated that the eighteenth dividend, just paid, amounts to sixty per cent., in the aggregate, upon the wages earned within the last nine years; that is, for every $100 earned, $60 have been received as an addition. As a statistical fact affecting these mills, a comparison of the month of May, 1889, with May, 1897, as an example, shows that the average pay of all the employees on the pay rolls, was ten per cent. greater in 1897 than it was in 1889, just before the beginning of the profit sharing, notwithstanding the standard price of wages, except mule spinning, was higher at the former than at the latter date, and the mills were running sixty hours a week, as compared with fifty-eight hours. The price of weaving was 5 5/9 per cent. higher in 1889; yet, the payrolls show that the weavers earned on the average of twelve per cent. more in 1897, than in 1889.

Another important benefit to all concerned is the satisfaction that it gives to the employees, which cannot be estimated by any money value; yet, it is a factor of the utmost consequence in the successful operation of any establishment where labor is employed. Profit sharing, with this mill, has had a stimulating effect upon the work people, serving to induce a more cheerful submission to discipline, punctuality, closer attention to work, care of machinery, cleanliness, and economy of waste.

A record of the weekly wage is given on one side of a card, and a profit sharing certificate made out on the reverse side, signed by the treasurer, and by the employee receiving the benefit of the dividend. The certificate, pro forma, reads as follows:

This certifies that John Jones has been registered as No. 10211, in the Profit Sharing Roll of the Bourne Mills for the term (26 weeks) ending June 11, 1898, upon the conditions hereby agreed upon, namely:

(1). To do faithful service as an employee of the corporation unto the end of said term.

(2). To promote its interests as far as acts and influence go, both in and out of the mill.

(3). To forfeit all claim to any share of the profits if any of these conditions are infringed.

Name (sign here) JOHN JONES.

(This certificate is null and void until signed by employee).

George A. Chase, Treasurer.

The principle underlying any scheme of profit sharing is to harmonize the profitable co-operation of capital and labor, and reduce discontent to a minimum. It is instituted for the purpose of improving the social status of the workman, by making him more of an integral part of an industrial develop-

ment towards which he is a contributing factor. The common workman seldom considers the fact, even if it ever enters his mind, that success in business is due more to executive ability than to manual competency and aptitude, and that the profits of the hands are the results of the power that plans for their cunning. Few that enter upon a business succeed, not more than three out of every one hundred. The rest fail, or simply exist. The few shining examples of success alone are more often seen and envied by the workman than the host of those that mark the failures of men who attempt to carve their own fortune, amidst contention and antagonistic influences.

TEXTILE SCHOOL IN THE SOUTH.

The establishment of textile schools in manufacturing districts is rapidly growing in interest, and some very substantial movements have been made that give much promise of success. The textile school at New Bedford is already assured, though we believe the details have not yet materialized. State legislators realize the importance of such schools to our manufacturing industries, and feel disposed to be liberal in the amount of appropriations devoted to their establishment and maintenance. The opinions of legislators were pretty well manifested at the last session of the general assembly of this State, in, that while there was a willingness to appropriate liberally money for purposes of this kind, it was thought that the communities and the industries in the neighborhood of the schools should contribute also towards their support, as being more or less directly benefitted by them. Fall River made a mistake in the way it went before the legislature last spring, in asking the State to do all, and the city nothing. The management of the petition in behalf of the Lowell school was also not the most judicious or politic one that could have been devised.

The State of Georgia, and the city of Atlanta, in particular, have shown a creditable degree of enterprise towards the establishment of a textile school in the latter place. We believe that the course that has been pursued and the general plans for the school, are the best that could have been done for the general object of technical education in this line. It would have been a mistake, that would have resulted in the probable failure of a school of this kind, had it been established for the sole purpose of textile education and nothing more. Making the school a department of an already fairly prosperous technical institution, has given the project the elements of success at the start. The prospects appear to be favorable for a school in connection with the Georgia School of Technology, with a fund of $30,000 or more to start with, including the value of the machinery donated. It is the intention to have a textile course run in conjunction with the academic course of the institution. The latter course embraces mechanical engineering, electrical engineering, and civil engineering; the leading object being to teach the principles of science, especially those relating to the mechanic and industrial arts. Of the contributions that have been made towards the school, not a dollar has been contributed by the mills of the State. We regret to see this apparent lukewarmness on the part of manufacturers, whose industries are the ones to be peculiarly benefitted by the technical instruction that will be furnished. Such a school elevates the character and tone of the manufacturing communities wherever its graduates happen to go. This can be as truly said about the institutions of this kind as about any of our schools, colleges or universities. Manufacturers do not study their real interests when they do not encourage by substantial gifts schools of this kind. More than moral support is needed; still, we know from interviews and communications had with prominent Southern manufacturers, that there is not a strong and general disposition to encourage schools

of this kind by moneyed contributions. They seem to think that they are helpful and good things, but this is about as far as they show inclination to go. We think such views might be legitimately entertained as being inexpedient, towards schools of this kind if they were isolated and devoted to no other purpose; but this cannot be said of that which is about to be inaugurated at Atlanta. The one there is a department of an institution already in successful progress along technical lines.

Of course, the greatest difficulty that will be contended with will be the securing of proper instructors, who should be those having the power to hold and excite the interest and attention of the students. Such instructors are rare. More than a simple knowledge of manufacturing is required.

Textile education is very well considered in a circular that has been issued by the Georgia School of Technology, to the effect that such instruction cannot be obtained in factories which are run on a commercial basis, for several reasons: (1) Superintendants are too much occupied to give instruction, and in many cases they are not especially qualified for such a work, however proficient they may be in the practical parts of manufacturing; (2) the machinery in one mill is limited as to variety; (3) no systematic or scientific training can be had in a short time; (4) in Southern mills no opportunity exists for instruction in the manufacture of the higher grades of cotton goods.

Of course, the Atlanta school cannot expect for many years to reach the efficient standard of the schools at Philadelphia and at Lowell. The surrounding circumstances will not warrant it.

MASSACHUSETTS MANUFACTURES.

The Massachusetts Bureau of Statistics of Labor has issued some valuable statistics of late, concerning the manufactures of the State, from which we learn that, in the State census year of 1895, the amount of capital invested in all classes of manufacture was $516,082,557, and the value of goods made, or work done, was $849,807,302, upon the average proportion of business done of only 50.05 per cent. of the maximum productive capacity. Here we find an important statement, that only one-half of the manufacturing capacity of the State was in operation in 1895. With this proportion of the maximum productive capacity, it would seem to indicate that the State was capable of turning out, when its manufactures were fully occupied, a product aproximating $1,600,000,000—far more than enough to pay off the national debt as it exists today.

The value of machinery, implements and tools in use in our State manufactures, amounted to $178,733,454, 92½ per cent. being of domestic make. With our manufactories running at only one-half of their maximum productive capacity, they gave employment to an average number of 432,272 persons; the smallest number employed at any one time being 357,249, and the greatest number, 518,744, showing a difference between the greatest and smallest number, of 161,495. The question arises, what became of these people that were idle, and how long were they idle? The statistics give us no clue to it.

Nearly 86 per cent. of the persons employed were engaged in the manufactories in the eastern part of the State. Of the total number, 26 per cent. of the persons were employed by the hour; 40 per cent. by the day; and 34 per cent. by the piece, or job. About 70 per cent. of the persons thus employed, were males, and 30 per cent. females. The average annual earnings of the persons employed for wages were $446.41. The majority of the male wage earners received less than $12 per week. The majority of the female wage earners received less than $6 per week.

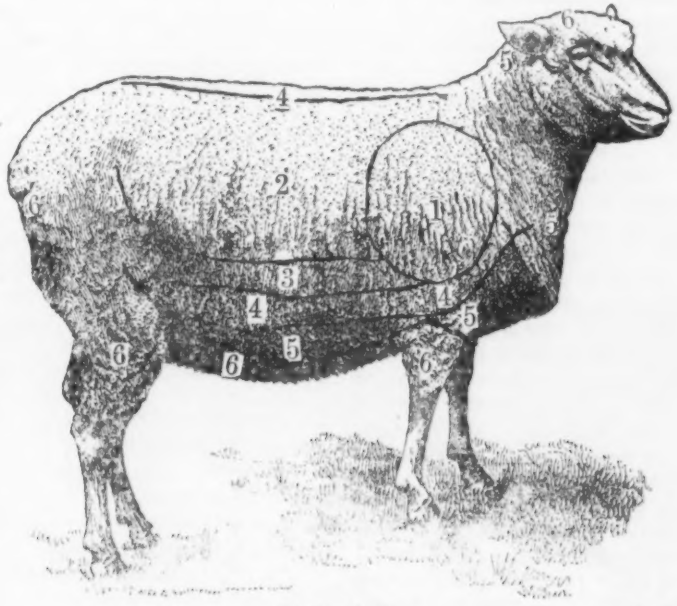
The mechanical motive power employed in the State was 676,792 h. p., chiefly that derived from the steam engine. Within the decade ending 1895, it is noted that the principal increase in motive power was due to the agency of steam. In that period, there was a decrease in the number of water wheels, but an increase in their power, showing a greater use of more efficient wheels. The utilization of electric motors was a distinguishing feature in the increase of motive power, within the decade named.

Wool Sorts and Skirts.

There is much indefinite understanding regarding the sorts of a wool fleece, or the location of the sorts according to fineness; also what constitutes the sorts of a fleece, as understood in the trade. We give, herewith, an illustration of a sheep with the sorts of its fleece marked according to relative fineness. As indicated, the finest fibre is expected to be found on the part numbered "1," the next finest on the part numbered "2", and so on to the sixth sort, which is the coarsest and most undesirable part of the fleece. The divisions that we have given should be taken as more suggestive than arbitrary, as different fleeces sort differently. These divisions we have made to conform to the most expert views that we have been able to obtain, from first class sorters, and apply to high-grade merino fleeces. What constitutes skirting, according to the method pursued in Australia, is somewhat uncertain, as it is performed in the interior of the country, at the time the fleece is clipped from the animal.

Broadly speaking, the skirts embrace the greater part or all of what may be termed the sixth sort, with possibly a little of the poorer portions of the fifth sort that is found on the front of the animal's neck, and on the side. The percentage of the skirts removed from the fleece depends upon its condition, in the amount of burs and trash found thereon.

There should not be, however, any confusion concerning the significance of skirts and sorts. Sorts refer to the quality, peculiarity and condition of the staple, while skirts refer purely to condition, without regard to any of the characteristics that affect the distinguishing qualities of sorts. That skirts should embrace the sixth sort, or any considerable portion of it, is accidental rather than otherwise, due to the fact that burs, trash, and other extraneous matter, are found there, and not elsewhere. Skirts, of course, refer to the outside borders of the fleece, which is taken from the animal with the division line running from the tail to the head, under the belly and neck, where the poorer qualities are to be found.



WOOL SORTS. *H. G. Kittredge.*

Buenos Ayres and the Wools of Argentina.

DANIEL S. PRATT.

In requesting me to give you an account of Buenos Ayres and the wools of Argentina, you apparently did not realize the writer's difficulty in dealing with a subject of such magnitude, in the limited space of a magazine article. What I am able to put before your readers must be of the most superficial character; although the facts and statistics which I may quote, are from none but the most reliable authorities, and of as late dates as I have at hand.

It will doubtless seem a very strange statement that in order to sail to Buenos Ayres in the safest and most comfortable manner, one must first go to England for his steamer, but this is lamentably true. There are several lines of steamers sailing from New York to the River Plate, but one is rarely tempted to make the voyage on one of them the second time, for they are much better adapted to cargo than to passengers, and the tedious stops at Brazilian ports frequently lengthen the voyage to thirty-five or forty days.

While at first thought it seems like a longer journey, it is really much quicker, as well as more comfortable to go via England. The Royal Mail Line steamers sailing from Southampton every two weeks, are of 5000 to 6000 tons, and well adapted to this service. They make the run from Southampton to Buenos Ayres—or rather to Ensenada where they dock and which is two hours by railway from the city—in twenty-one to twenty-two days, which combined with the crossing to England on one of the North Atlantic ocean greyhounds, would make the voyage from Boston or New York in from twenty-six to twenty-eight days.

From time to time direct lines have been organized in the hope of making a profitable business with the States, but in almost every case the result was a dismal failure, from the lack of proper support by the governments and merchants at both ends of the line. Just before the breaking out of our war with Spain, however, the question of a direct American Mail Line of steamers from New York to Buenos Ayres, was again under serious consideration, and it seemed at that time as if the Act of Congress, approved March 3, 1891, might in the near future, produce some tangible result. With a liberal subsidy from both the United States and the Argentine governments for carrying the mails, and the increasing commerce between these two countries, as well as with Brazil, it would seem as if it might be possible to make such a line a success, and as permanent an institution as is the English Royal Mail. These steamers, as proposed, will average sixteen knots per hour in ordinary weather, which would make the voyage from New York to Buenos Ayres in seventeen days. This subject is very ably handled by Francois S. Jones, Charge d' Affairs ad interim at Buenos Ayres, in a consular report made by him to the United States Government. That our commerce with the Argentine Republic is growing may be seen from the fact that whereas the exports from the States to Argentina, in 1892, amounted to $2,927,488. United States gold, and the imports into the States from Argentina to $5,343,798, U. S. gold, in 1897 the former amounted to $6,072,478 U. S. gold, and the latter to $10,772,627 U. S. gold. So that the combined trade between the two countries in 1897, amounted to $16,845,105, showing an increase of $8,573,819 over the combined trade in 1892, or a little more than double.

Hand in hand with this new line of American steamers will doubtless stand the newly chartered American International Bank, which, with the increased financial facilities it will bring and the direct exchange with New York instead of London, will surely unite these two countries in closer commercial relations than ever before.

Mr. Pratt is well known in the wool trade of Boston, having been engaged in it for many years, and for the past few years has been especially interested in Argentina wools, sojourning a part of the time in Buenos Ayres.

General Roca, the President elect, who takes office in October, is an extremely progressive, up-to-date man. He is highly esteemed in London for his great executive ability, and there has been already a decided improvement in the value of Argentine bonds in anticipation of the conservative financial policy he will adopt. General Roca is a warm friend of the United States, and he will undoubtedly co-operate with our able United States Minister, Hon. William I. Buchanan, whom

CENTRAL MARKET, OR MERCADO CENTRAL.

President McKinley had the wisdom to re-appoint. The next few years should show a very great increase in all lines of trade between the two countries.

The Argentine Republic has a length of 2300 miles from Bolivia to Tierra del Fuego, and the average width is about 500 miles. The area is 1,212,600 square miles. The population was, at last accounts, 4,500,000. Buenos Ayres is the capital of the Republic and the largest and most progressive city in South America. By the last census, the population was 712,000, but it is claimed at present to be nearer 750,000, a population far too large for the national welfare of a country whose entire population is only 4½ millions. Buenos Ayres and its ocean seaport, Ensenada, are well equipped with dock facilities. At Ensenada there is an excellent system of docks three miles in length, extending to La Plata the capital of the Province of Buenos Ayres, and with sufficient depth to admit vessels drawing 24 to 26 feet.

Buenos Ayres has quite an elaborate dock system. The Madero docks extend for nearly four miles along the city front. Each or them has a shed which cost £60,000, and which has four floors, with three hydraulic cranes, capable of lifting 30 cwt. each. The aggregate floor space of these sheds, is something over 14 acres. The quays have 46 travelling cranes of 30 cwt. power, besides two that can lift 5 tons each, and a fixed crane of 30 tons power. Two miles south of the city are the Boca port works. There is about twelve miles of channel which it is intended to maintain at a depth of 21 or 22 feet. The work that has been done on the water front of Buenos Ayres has cost, up to the present time, about £8,000,000. It is found that the

river deposits a million tons of mud every year, hence the annual cost of dredging the channels amounts to fully £33,000 sterling. The principal industries of the Argentine Republic are grazing and agriculture. Wool is the chief export, while wheat, corn and linseed are also largely exported. There is a growing export business also in flour, frozen mutton and live stock. The following table gives the official figures showing the exports of the twelve months of 1897 with the value in Argentine gold dollars.

EXPORTS FROM JAN. TO DEC., 1897.

			VALUE GOLD
Wheat,	tons,	101,845	$3,470,351
Corn,	"	374,942	5,478,718
Linseed,	"	162 477	4,666,288
Flour,	"	41,443	2,411,719
Wool,	"	205,571	37,450,244
Sheep Skins,	"	37,077	4,094,640
Dry Hides,	"	29,300	8,596,344
Live Sheep,	Numbe	504,128	1,512,684
" Cattle,	"	288,121	5,018,222
Frozen Wethers,	"	59,894	2,035,778

As will be seen wool is the largest export product, amounting to $37,450,-294 gold in 1897; an amount about equal to the aggregate of all other exports. The history of the development of this great industry, with the almost dramatic incidents of its failures and partial successes during the first two centuries of its feeble existence, would require far more space than the limits of this article will permit.

In 1550, Don Juan Nunez del Prado invaded Tucuman, one of the Northwestern Provinces, and brought with him a flock of sheep from Peru. In 1587, Don Juan Torres del Vera y Arragon introduced 4000 Spanish merino sheep from Peru, which were distributed in the Provinces of Santa Fe, Buenos Ayres and Corrientes. These sheep were the origin of the countless thousands which for two hundred and fifty years wandered neglected and uncared for over the wild Pampas. During the 17th and 18th centuries, sheep were neglected and despised, and allowed to roam at will, and increase or die off as the case might be. The beginning of the present century found the sheep stock of a very poor type, bearing a miserable fleece. They were then of two classes. The Pampa sheep descended from the long wool mountain sheep, and the Criollo descended from the Spanish merino, but so degenerated as to bear very little resemblance to the latter, either in wool or type.

In 1794, the same year in which Spanish merinos were first imported to New South Wales from the Cape of Good Hope, 10 rams and 20 ewes were brought from Spain to the Banda Oriental, then one of the provinces of the River Plate Viceroyalty. From this time there were various importations of merinos, until 1832, when the demand for merinos became general in the Argentine. Breeding developed rapidly until 1837, when it received a serious check by a civil war which convulsed the country. From 1836 to 1838, 4200 merino sheep were imported. In 1836, the improved merino from the Electorate of Saxony was introduced, and in 1838 the first lot of German Negrettis was imported. This latter breed with its ultra fine wool, attracted great attention, and from this time the merino clip increased and improved. Shortly after 1850, the French Rambuillet Merino was introduced, and by 1857 it had been successfully crossed with the Mestizo Negretti, resulting in a larger sheep and a medium fine grade of wool. Later importations of rams from the imperial stud of France built up the family of the Argentine rambouillet merino which for many years held the attention of the wool growers.

It was found, however, that the wet, marshy ground of much of the pasturage, was very injurious to the Merino and Saxony sheep; and, hoping to get upon a more profitable basis, experiments were made with Southdown, Romney marsh, Leicester and Lincolns, resulting in most instances in a decision favorable to the Lincolns. The wool growers, however, maintained for many years a decided hostility to anything but merino. The coarser wools, to their minds, were too closely allied to the wretched pampa sheep of their youth, and it was not until 1884, when a decline in the value of merino

wool occurred, and when long wools came into strong demand, selling at high prices, that the Argentine wool grower began to see that those who had crossed their Rambouillet merinos with Lincolns, not only got a larger return from the fleece, but in addition secured a second return from the valuable carcass.

In 1885, lincoln blood was extensively introduced and crossed with the rambouillet merino. In 1888, twenty per cent. of the clip was of this Ram-

per cent., but as a rule, on wool suitable for importation by American mills, the average rejection of skirts will vary but little from 12 to 15 per cent.

This is quite different from the Australian method of skirting. There the fleece is skirted on the ranch at shearing time and the body wool tied up as a fleece before it is handed to the baler, and there is seldom less than 25 to 30 per cent. of the skirts rejected there, and frequently it is more than

MERCADO CENTRAL—INTERIOR VIEW.

bouillet-Lincoln cross. Today fully 75 per cent. of the Argentine clip is of this Lincoln crossbred type, as it is now called.

In consequence of the peculiar pasturage of the country, there is an obnoxious spiral burr, called "carretilla," which adheres to the belly and skirts of the fleece. This necessitates the careful removal of these burry portions, by "skirting the fleeces," which is done at the time the wool is graded at the barraca in Buenos Ayres. Some of the choicest clips that have been well cared for, show a rejection of stained and burry skirts as low as 10

that; the various parts of locks and pieces making the process partially sorting, while the even quality of body wool is tied up in the form of a fleece. When the Australian wool gets to Melbourne or other local markets, it is not only skirted and graded, but also baled, in which condition it is sold.

The Argentine system is quite different. There the wool comes from the ranch to the central market in Buenos Ayres, loosely tied up in sheets (see illustration interior view of warehouse), which are emptied into piles containing all grades. The round lots of orig-

inal fleeces are sold just as they come from the farmer. Sometimes the loose belly locks are by themselves, and sell at one-half the price of the good wool, but oftener they are rolled up inside the fleece, as deftly as an Ohio or Michigan farmer generally stuffs his fleeces. It is necessary, therefore, to remove the strings and skirt the fleeces after the wool has been received at the barraca; and having taken the strings off the fleeces to properly skirt them the wool is usually baled loose, without strings. To retie the wool after skirting and grading would greatly increase the cost. There is the objection to this method, that when enough of a given grade has accumulated to have a baling of, say one hundred bales, the peones in taking it from the pile, putting it into sheets and packing it into the baling boxes are apt to tear the wool more or less, which makes small locks that are rather hard to sort, in the United States mill. This evil is also true, though to a smaller extent, in tied-up original fleece, and is as true in American as in any foreign wool. This particular method of skirting the fleeces in the exporters' Buenos Ayres barraca has been in vogue from 1886 up to the present time.

Unlike Australia, again, we are on a totally different basis as to the marketing of the Argentine clip. Here the grower consigns his wool to a commission merchant or broker who belongs to the camara or exchange. He puts it into a pile on the floors of the mercado central where the buyer makes his bid, and the highest offer takes it. The wool then goes to the barraca where it is graded, skirted and baled, after which the exporter ships it after paying the government an export duty of 4 per cent. This export duty is upon an arbitary fixed value of $2.30 gold, the 10 kilos.

The wool is sold for so many dollars the 10 kilos in moneda nationale—Argentine paper. Inasmuch as gold fluctuates every few minutes, and as the change must be made through Argentine gold into sterling, thence into United States gold dollars, it can readily be seen that it is necessary for one to be pretty wide awake and know how to figure costs very accurately. The selling begins at 6 a. m. and closes at 11 o'clock, when there is a grand rush to the telephone to have the people at the office cover the day's purchases immediately with gold,—for a slight difference in the premium will often sweep away one's buying commission.

The conditions here are quite unlike any other market in the world. One has to think and act quickly and make no mistakes, as is in competition with the brightest and most expert wool buyers of the world. If any smart American experts desire to test their experience, there is no better place on earth to do so than in Buenos Ayres. At the same time there is more certainty there that one will get what he buys, as he buys it, and with less danger of tricks of any kind being played upon him than in almost any other large market.

With all the interest that United States manufacturers have shown in Argentine wools during the past three or four years, and the successes that many of them have made by its use, it seems strange that they do not learn the whole lesson, and get their mills so adapted that they can use even the burry lots as do the French and Germans, whose cloth, made from Argentine wool, is sent over here to knock us down in the goods market. In this connection I will quote a German test of quite a large lot of greasy, burry bellies and skirts that were shipped to Germany for sale during the season of 1897. There was a yield from the grease weight of 50 per cent. top and noil, and the test of the tops for burs showed only 30 whole burs and 11 half burs in 300 meters. While this top was naturally rather short stapled, from the stock it was made of, it had a good color and proved to be a good worker in its proper place. Why shouldn't our enterprising American manufacturers do as well as their foreign competitors in this matter? They are certainly quite as brainy and keen, and

the lesson should not be very difficult or costly to learn.

The central market, where the wool and other produce is received and sold, is an immense structure with 30 acres of floor space. It is located on the south bank of the Riachuelo, a creek which has been widened and dredged, and which bounds the southerly end of Buenos Ayres. On the north bank, or near it, many of the barracas are located, so that the facilities for shipping

ITALIAN AND NATIONAL ARGENTINE BANKS.

are excellent. On the day when the photograph of the accompanying interior view was taken, there were 45,000,000 pounds of wool exposed for sale in piles upon its floors, besides several hundred freight cars on the tracks outside awaiting an opportunity to unload. The receipts of wool at the mercado central from July 1st, 1897, to April 30th, 1898, which latter date virtually closed the present season, were 132,347 tons of merino and crossbred wools.

The cordova or carpet wools are seldom sold at the Buenos Ayres market, Rosario being the principal centre for that class. While more or less wool is sent to the central market in the months between seasons, there is comparatively little of it sold before the regular season, which usually opens in full force about the 1st of November.

Shearing begins usually the last week of September to the first week in October, depending upon the weather. In the southerly provinces it is later, however, as the farther south one goes the later the spring opens. For the last two years the clip has been very closely sold up and there was little to carry over. From September 1st, 1897 up to May 1st, 1898, something like 500,000,000 pounds of all classes of wool had been exported from the various ports in the Republic, the greater portion of which went to Continental Europe.

During the wool season of 1896-1897 the United States took about 52,000 bales; but in the present season our importation dropped to about 3000 bales. One of the reasons for this great falling off was the application of the skirting clause of our tariff law.

Under a misaprehension of the facts, our customs authorities marked up the skirted Argentine wool to the double duty of 22 cents per pound, while admitting skirted Australian at 11 cents. Their plea was that Argentine wool was not skirted "in 1890 or prior thereto," hence it did not come within the exception which the law provides for the admission of skirted wools. This contention was, however, proven to be erroneous, and an unjust discrimination against the Argentine Republic, and on April 30th, Asst. Secretary of the Treasury Howell instructed the collector of the port of Boston to pass Argentine skirted wools at 11 cents per pound. This decision which was only made after a most thorough investigation by the U. S. Treasury Department, was a just act which placed our friendly sister republic upon an equality with the great English colonies. It will not only make it practicable to increase our importation of those very useful Argentine wools the coming season, but it will also add some millions of dollars custom's revenue to the U. S. Treasury which will be much needed after paying for our expensive war with Spain.

The financial interests of Buenos Ayres are almost wholly monopolized by foreigners. English capital has built the railways and docks, and many of the most important enterprises of the country are owned or controlled by English capital. The enormous holdings of Argentine securities by the Messrs. Barings contributed to, if they did not precipitate, the suspension of that noted house. Almost all matters of exchange are made through London, and so far as banking facilities are concerned, Buenos Ayres is very well equipped. Rates of exchange are usually high however, and with the development of closer commercial intercourse with the States there has been a growing demand for some means of direct exchange with New York. The American International Bank which is to have branches in all the principal capitals of South America, will enable the exporter of wool to the States, to draw his exchange directly upon New York in United States gold dollars as well as to enable the Argentine buyer of American manufactures to remit through the same medium. This will cut off an element of expense, that has in many instances prevented business from being done. The writer knows of cases where large contracts have been made with Buenos Ayres merchants where the American wool debtor and the New York agent of the Argentine debtor, settled the balances in New York, thus avoiding the expense of going through the usual course of negotiating London exchange on both sides. In at least one case where the American seller of manufactured goods had bid closely to secure the business, this saving in exchange was the profit of the transaction. Of course this was a favorable chance and could not apply to every day business, but the American bank will undoubtedly divert a great deal of exchange on United States business from London, and bring our commerce down to the basis of United States gold dollars. Among the foreign banks are the London and River Plate, and the London and Brazilian, both large and prosperous institutions. There are also several large German, French and Italian banks, and a branch of the great Deutsch Bank having been well established here for many years. There is also the National Argentine Bank.

It may be of interest to note the movement of the gold premium for the past thirteen years. I quote the average premium rate for each year viz.:

YEAR.	PREMIUM.
1885	37 per cent.
1886	39 "
1887	35 "
1888	48 "
1889	80 "
1890	157 "
1891	273 "
1892	229 "
1893	224 "
1894	257 "
1895	244 "
1896	196.64 "
1897	191.33 "

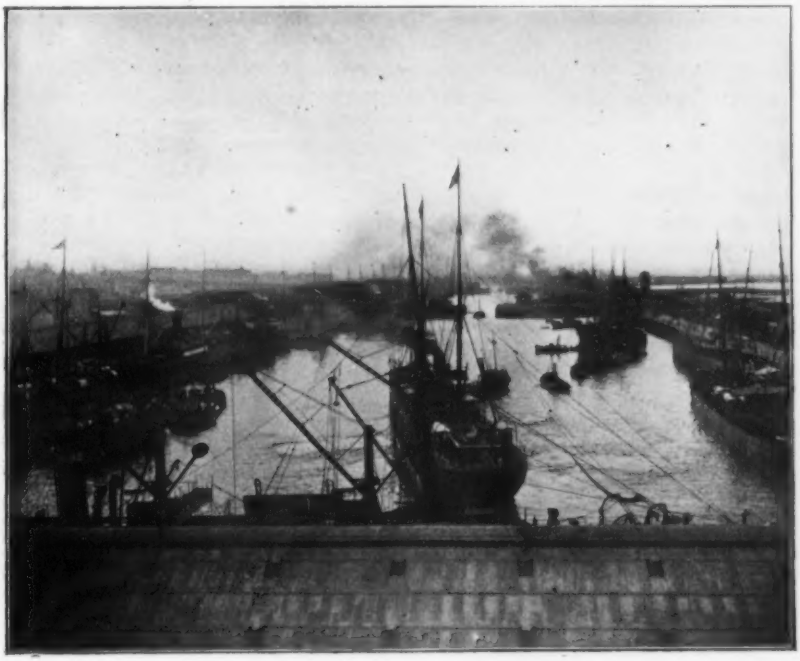
1898

AVERAGE PREMIUM.

January,	164 11 per cent.
February,	164 "
March,	167.37 "
April,	165.80 "

The lowest average day's rate in May, 1898, was 155.40 per cent., and the highest day's average rate was 167 per cent., up to May 27th, when gold closed at 161.80 per cent.

The Argentine Republic is a great field for American goods of all kinds. There are openings for anything that we can sell that is a shade better, or a fraction cheaper than what comes from Europe. American harvesting machinery is very generally used, also kerosene oil, pine lumber, bicycles, boots and shoes and cotton goods, to some extent; and not long ago an Illinois manufacturing company sold one hundred windmills to go there. One trouble with American export business is that with all our skill in making things we have not yet learned the art of selling. The German or the Englishman desiring a market for an article, learns what shades of color and what labels are wanted, how many yards they want in a piece, if it is cloth, and any other item that enters into the native requirement. Then he learns to sell goods in the language of that country, goes there and camps with them, until he secures the trade. In too many cases the American manufacturer has consulted his own notions and put his goods up in his own way, and when the foreign buyer makes an effort to open business, he replies, "there are the goods as I make them, if they suit you, I shall be glad to sell them to you, but I cannot change my usual system, and if you don't like them as they are, we cannot trade." The writer has heard many complaints from foreign buyers of textile fabrics just in this line, and is satisfied that when we get ready to give the foreigners what they want, we can have a very handsome export trade in all departments. When that happy day arrives, there will be but little talk about over-production, idle looms and closed factories. Our people will be contented because they will be well employed, well paid, and too busy to listen to the political fallacies that too often in the past have led them into strikes and other difficulties. The rising generation will, I hope, be led to master the modern languages, so that having worked their way up to positions of responsibility in the various industries, they may be able to sell their goods in German, French, Span-



DOCKS Nos. 1, 2 AND 3—LOOKING NORTH.

ish or Italian. In this connection let me say that it is claimed that there are more languages in every day use in Buenos Ayres, than in almost any city of its size; and the number of young men one meets there who can transact business in three or four different languages is astonishing. The United States can no longer be called a nation of "infant industries." They have developed into maturity, and in the new era that the Spanish war is opening to our nation, there will be glorious business opportunities for everybody who is awake to grasp them, and perhaps the best buyer of American manufactures may be the Argentine Republic.

SOUTH BASIN—BUENOS AYRES.

—A new departure in local wool-selling has been successfully inaugurated at Melbourne. Eleven gentlemen, impressed recently with the circumstance that the incidental charges in connection with the sale of wool in Melbourne were too high compared with its selling price, undertook to guarantee to take up 100 shares each, at £1 per share, to start a company, to be called the Co-operative Wool and Produce Company, with the object of quitting wool and produce at the minimum of incidental expense.

—Shetland women of all ages, ranks, and classes spin for profit or for pastime, and there seems to be a fascination about the pursuit incomprehensible to the male understanding.

—The Scotch manufacturers of tweeds may fairly claim the credit of leading the way in England, in fancy styles, in conformation of which the high-class and earliest buyers in each season, call upon them to take precedence in the first show.

—Probably the first experiments made in the production of photographic prints on vegetable fabrics by means of dyestuffs were those suggested by the characteristic sensitiveness to actinic light of certain substantive colors when in the diazotized state, notably primuline.

The Revival of Hand Loom Weaving.

Paper read by Miss Clive-Bayley before the Society of Arts, England.

(Continued from July.)

The districts in which hand-weaving in wool flourishes are notably the outlying districts of Ireland and Scotland, where the principal sources of profit are the various tweeds, which have won for themselves a well-deserved fame. (See Textile World for March 1898 article on "Home Industries.")

Certainly in one district of Ireland, the industry is so managed that not a penny of expense is incurred beyond that of absolute manufacture and cost of carriage. Advertisement is not required, for the goods advertise themselves, and are in great demand. Agents are not required, nor is any profit required beyond that which covers the absolute expenses of the undertaking. Now, of course, this fact would be sufficient to stamp the enterprise as a non-commercial undertaking, and to brand it as charity in disguise. It may, however, more justly be classed under the head of economic and industrial work, for wherever an industry puts a pound a week into a cottager's family pocket which would otherwise be dependent for subsistence on the produce of bog or moorland, such an income at once places them outside of dependence on the poor-rates, and thus incidentally assists others as well as themselves, and adds to the prosperity of the community at large. Care, however, has to be taken in all such cases that, when once the original organizers of the work give it over into other hands, the status of the workers does not degenerate by means of certain agencies, which in another part of Ireland has impoverished a formerly most flourishing industry.

The system as it now works is this. An agent buys in London a large consignment of tea; this when delivered in the district of which I speak, costs 1s. 3d. a lb.; with each pound of tea he provides sugar to the value of about 3d. He charges that tea and sugar to the people at 3s., and gives them one-half pound of tea, say for a yard of material, though the rate of payment may, in some instances, be higher. The agent sells that material in the English market for 2s. 6d. or 3s. a yard, which is not only cent. per cent. profit, but is also considerably below the actual cost of production, and thus while defrauding the actual producers, pulls down the price of labor throughout the country.

As to the cost of production. The average price, say, of wool, is from 10d. to 1s. per pound. Counting for waste, which in some wools is considerable, a pound of wool goes to a yard of material. The price of washing, carding, spinning, and oil—which Irish and Scotch industries use—comes to another 1s. The cost of dyeing is from 6d. to 9d. per pound, and the cost of weaving, from 3d. to 6d., thus bringing the cost of production, minus carriage, to 2s. 9d. or 3s. 3d. a yard. When this is sold through orthodox channels in the English market, it realizes from 3s. 9d. to 4s. 6d. a yard, tailors and wholesale houses purchasing it at about the lower sum.

Now, it seems at first sight very easy to decry this system of payment in kind, but not long ago I heard that the Irish women folk preferred a system which secured to them a certain amount of grocery to the more easy payment in coin, which had a habit of going into their husbands' pockets and turning into drink. I have never been to Ireland and so cannot tell how things are managed there, but I know in an English village if a woman wants a drink she can get it in exchange for bread, and I suppose there may be similar facilities in Ireland.

These details, however, explain the matter now in dispute between the two sections of the Scotch industries, one upholding the establishment of grocery stores, the others avoiding any such system, which however admirably managed in the present, and the very greatest boon to outlying districts, may so easily degenerate into payment in kind, and that terrible truck system, which however illegal,

may nevertheless crop up in new forms in distant and poverty-ridden parts.

With regard to other branches of handweaving, the one I should most urge to the front is linen. In Ireland and Scotland the tweed industry is so well established, that I would not encourage any English countries to develop that special line of weaving. It it already well represented at Winterslow and Ramsbury.

True, wool is the natural produce of this country, but if anything further is to be done in this line in handweaving, it ought to be in lighter fabrics, or in the old-fashioned whinsey, which lends itself to more general use than the heavy cloths, finer spun, so fashionable.

Linen, it appears is always in request, and the American market, last year, made greater demands than could be met.

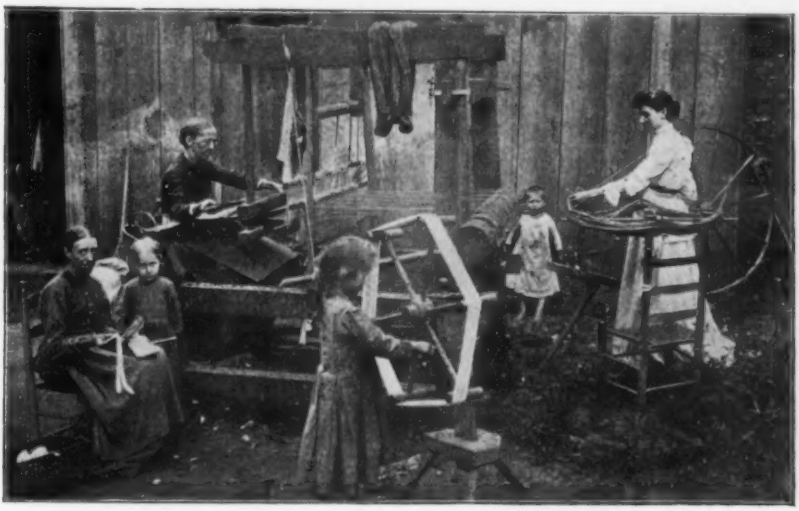
In the direction of art weaving and tapestry, there lies a practically unoccupied field of delightful work. It is probably better suited for those whose natural talent lies towards the higher branches of artistic development. There are always, in every age, wealthy patrons, those who will gladly acquire rare works of art, and, though the field is limited, there is no reason why it should be deserted. It is one of the lessons we have to learn. We have all been working for time, and against time. Why not work for eternity, or, at all events, for posterity? Those who work for today, perish with today; but they who live with the knowledge that tomorrow is but the continuation of today's duties, that time is but an artificial division, and really is synonymous with eternity, they live really and work honestly, and throw the shuttle to some purpose, weaving a web which another may perhaps inherit, and beginning what another may complete. But while thus sketching out hastily and cursorily the possibilities which may be before us in the revival of handweaving, I would throw out a few hints as to the direction our efforts for its advancement might take.

The school system of today offers many opportunities for the training, not, of course, specialists in every branch of trade, for the object of education is not apprenticeship, but the development of general intelligence. As with machinery, so with intelligence; directly you specialize you circumscribe your powers; directly you concentrate you may gain strength, but you lose in other directions. Nevertheless, if you wish to encourage handicrafts, the varied occupations of the Education Code gives the opportunity of educating and developing many of these faculties, and much of that manual skill which will hereafter be of use to the textile worker. Nay, more, the nature object-lessons will give the children of this generation a far greater insight into the resources of their country than was enjoyed by their forerunners, and should these fortunate circumstance be enhanced by an adaptation to older classes of similar forms of instruction, we may gain a class of workers ready prepared for hand-work, intelligent in mind, and comprehending the value and beauty of manual labor. If again the spirit of travel, which the fashionable bicycle has awakened, leads our intelligent classes to travel abroad, they may well do so with a purpose. How is it that wherever you go—in the wilds of Lapland, in the forests of Finland, on the steppes of Russia, the German traveller, inured in his early school days to foot wanderings of many weeks duration, or to the artisan tours so frequent, and so extended, is to be found omnipresent, and omnivorous (if we may use the term) in his trade hunger. Everywhere his hideous packs are to be seen, his polyglot tongue to be heard. Rather than not drive a bargain he will blunder through every Continental tongue, sell his goods below the cost of production rather than not sell them at all, and all along and at every moment glean money for himself, and information for his fatherland. He will penetrate his way to the ice sea and look what the White Czar is putting up shanties for

on the only open harbor of that frozen coast. He will drop down the Danube in a cattle boat, search for old coins on the Volga or the Don, and do a thriving trade all the while, till a tariff war still more severe than the last drives him back to his own country. Where all the time is the English traveller? You never meet him. You may scour these countries and tramp over Belgium. If you want a special article from abroad, and cannot get it yourself, it is not an English traveller but a German you must ask for it. Now why should these things be? Cannot we, the greatest nomads in the world, make headway against this clever and everdominant and intrusive race?

Surely the ambition of every English man and woman, should be to protect our trade, our manufactures, and our commercial interest in general against this insidious policy. That patriotism is yet alive, and to be kindled by a spark, German travellers know well, and the impetus given to one home trade only, that of narrow braid and trimming weaving, by the German Emperor's telegram to Kruger, was an object-lesson which might well be repeated. It is not that we cannot work, that we cannot weave, but merely that the spirit of industry has received blow after blow and has become inert. Machinery on industry, as we have said, has a paralyzing effect; foreign labor invasion is almost equally numbing; while certain commercial treaties put, at least in the silk trade, a final weight to the balance, and seem altogether to lay the former energy and industry of hand-weaving trades in the dust.

If the revival of our hand-weaving is to be a success, if we are to reconquer lost ground, we must not sit still and admire our energy and be proud of our revival; we must carry our goods to the open market; we must do as the Germans do—carry our campaign into the heart of distant countries, and conquer by force of persistency as well as by the virtue of excellence. If I had time and money, I would organize a very army of lady travellers, and trust to their wit and their energy to assist the home market.



HOME INDUSTRY IN THE SOUTH—UNITED STATES.

But then money must also be laid out at home. We must not only teach those who can afford to pay for instruction, but we must have the means wherewith to pay the many who are incapable of outlay. One large silk firm is already raising the

roof of its establishment, in order to accommodate a large number of such hand-working apprentices. Another applied, though for what exact purpose I have not discovered, for 500 similar workers. Another, and I believe a linen firm, was reported to need 2,000 workers. And it is not always actual weavers that are wanted—winders, harnessers, enterers, twisters, harness-makers (though harness is now chiefly made by machinery), can all earn fair wages at their trade, especially in the smaller firms where gas-engines have been discontinued for winding since the Factory and Workshop Acts have been in force.

The ever-changing details of legislation affects our various trades, now in one way, now in another. Boys and girls cannot easily now obtain labor certificates before they are fifteen, but they can leave school at a much earlier age. Hence in Bethnal-green several children have, since a recent change in the educational code, been taught the rudiments, at all events, of these arts, who would have otherwise have gone straight from school to quite a different profession.

There is no doubt one species of legislation all hand-weavers would love to see come through Parliment. Why, if we are not allowed to call margarine butter, should any rubbish made of wood be called silk, or silk be so weighted with lead as to be practically a metal? Why should flax, rhea grass, cotton wool or any other substance be allowed to pass as silk? Why should best serges be composed of rhea grass, and yet pass as serge, or velvet be made of the ravellings of waste, and be called velvet instead of schapps? We may all believe in free trade as devoutly as we believe, say, in the Divine right of kings, but free trade does not consist in deception or imitation. Machinery may not care what rubbish passes through its manipulation, but a hand-weaver must be and always is more or less of an artist. He may be, and he almost always is, an inventive genius (hence the origin of one of his mechanical substitutes for his own diligence), but he would consider it below his art, a degradation, if you will, of his genius, to make rubbish and spoil his work with bad material. Hence, hand-weaving represents not only skill, but honest work—it is the conscience of weaving a forcible contrast to the shoddy and scamping work of a machine.

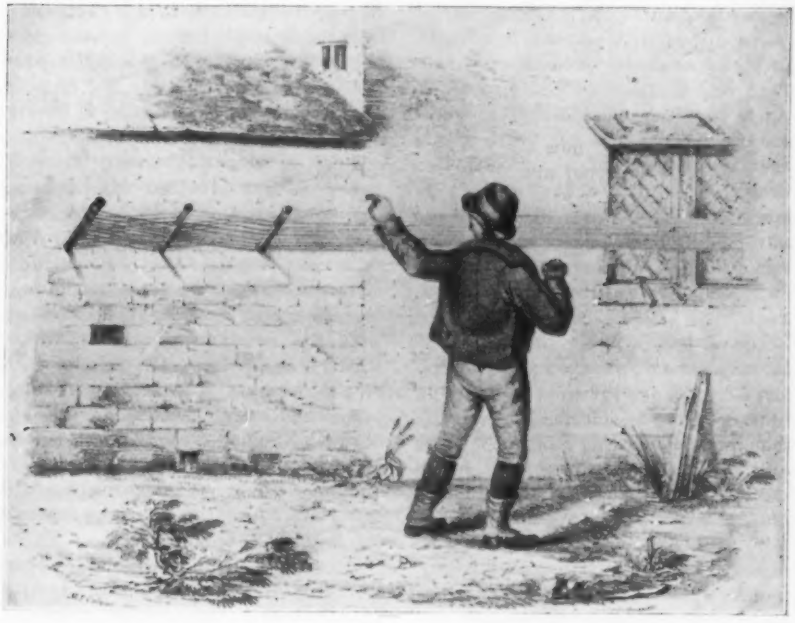
We have, however, barely touched on that all-important point—wages. What can a hand-weaver earn? As a matter of fact a hand-weaver is paid better than the watcher of machine labor. He is also better paid now than at the end of the last century.

The system of payment in the silk trade has been on the system of a retaining fee, men who were skilled in their work were, and still are in certain firms, paid from 35s. upward to £2 10s., and even £3 a week. This they had to work off during the week, but if the master had not sufficient work for them, they ran into debt as it were, a debt of work. I have known men in bad times be £20, £30, £60, and even £80 in debt to their masters. Naturally this was a heavy drain on a firm, and though in good weeks a man might possibly make from £5 to £7, as often as not the debt was never cleared off, and this system of payment is to my mind one of the chief causes which led to the employment of machine versus hand-weaving in silk. It is a ruinous system for masters when trade is bad.

The payment is regulated by a well-known tariff, so many pence per yard for so many threads; an extra ½d. or 1d. would be added for an extra 1,000 threads, or for an additional shuttle, for the use of a Jacquard machine, or for an extra roll; so that what might at first sight seem a ridiculously low price, would mount up to more than double the apparent sum.

For women hand-weavers no such extravagant earnings are possible, because they ought only to go in for light work and narrow widths, and have to be content with from 12s. 6d. to 35s. a week. The latter is an outside price; 7s. 6d. and 10s. 6d. are the

prices earned in the country by beginners. Hence it is that employers prefer country factories and women, for in both cases lower prices prevail. A guinea per week is, however, said to be a fair sum in London. A lady who can spend a small sum on silk, and has her own clientele, can earn proportionately more. The payment for a silk square of a given size, is paid for at the rate of 1s. 1d. for weaving. A woman is expected to weave three a day, but it is an expectation I have never seen realized. However, that silk square contains (let us say) about 4s. 4d. of silk. If a weaver spoils it, she is charged 7s. 6d. If it is sold to the trade at 10s., and to the general public at 12s. 6d. or 15s., then the lady would realize a handsome profit, even counting the cost of setting up her work, which is an expensive item. If she works to private orders, she can, of course, quote her own price, but even if she sold them to the trade, she would not lose by her transaction.



PEG WARPING.

Dyeing in the Sliver.

We have before us illustrations and an account of machinery devised for the continuous dyeing of sliver. The problem of sliver dyeing has occupied the mind of many inventors; but few, however, of the systems which have been suggested have met with any substantial favor; in fact, it may be said that no system thus far has been truely practical, in an economical sense.

While there has been considerable advance in the dyeing of cotton in the hank, due largely to the intelligent use of coal-tar colors, the same cannot be said of the mechanical processes by which the yarn is handled. Various mechanical devices have been invented and tried with the result of being soon discarded as wholly impracticable, and the old system of dyeing by hand again resorted to. Dyeing in the hank, however, mechanically, or otherwise, is not really an ideal opera-

tion, due to the extra expense of labor, such as reeling the yarn into hanks, and, after dyeing, winding back into cops for weaving, which also are sources of waste. Another objection to dyeing in the hank is the difficulty of obtaining even shades, which occur not only in the different lots but in the same lot of yarn. The dyeing in the cop, which has been resorted to, but without success, has the same difficulty to contend with:—of uneven shades, due to unequal and non-uniform penetration of the dye liquor. The dyeing of cotton in the raw state is well known as having many objections, although it posesses the merit of giving evenness of shade, but brilliant colors cannot be obtained by it. Aside from this, the difficulty of working the cotton and the extra waste that is made, militates against this system. We belive that everything considered, mechanical dyeing of the sliver is the best way for coloring cotton, provided, of course, that the devices employed can be made practicable.

The machine which we have particular reference to, for the dyeing of cotton silver, is one invented by Ingre D. Mattei. It is a continuous automatic machine, consisting of a range of five sections, four of which are fitted with liquor troughs, and drawing and squeezing rollers. At the entering end of the machine the slivers are drawn, six at a time, from the cans in which they have been coiled from the carding machines, and pass side by side in a continuous ribbon or band about 3 inches wide, through the different sections of the dyeing machine, the dyed slivers leaving the machine at the delivery end rolled up in the form of flat cheeses. While passing through the liquor in the saturating and dyeing cisterns, and between the squeezing rollers, they are carried between perforated bands, to guide and support them and prevent the disturbance of the fibres.

In the first section of the machine the sliver is thoroughly saturated with water and the air contained in the fibres expelled, by means of combined steam and water injector, which is a very important point in the process to insure even dyeing, on account of the natural antipathy of the cotton fibre to water.

At the end of this section the slivers, side by side are plaited by means of an automatic arrangement into a U-shaped trough, though which they are carried by means of two endless lattices or creepers. These lattices travel very slowly, being driven by worm gear, so that the sliver is from 15 to 20 minutes in passing from one section of the machine to the next, thus allowing it ample time to become thoroughly saturated with the liquor contained in the trough.

In the next section the sliver is drawn out of the delivery end of the creeper trough, and passes through liquor troughs provided with squeezing bowls, where it is impregnated with the necessary mordant for the color to be dyed. At the delivery end of this section, it passes again into a creeper trough like the first, but filled with the mordanting solution, from which it is drawn by the third section of the machine in which the dyeing proper is performed, the sliver passing between endless perforated bands through squeezing bowls and under and over guide rollers through shallow cisterns containing concentrated dye liquor, either hot or cold.

A creeper trough at the end of this section carries the sliver to the fourth section, which is provided with an injector and trough, and is used for washing and soaping, the final wash being by means of a spirt pipe.

After washing, the sliver is conveyed to the last section of the machine, where it is again passed through an injector, then strongly squeezed, and wound into discs in the form of flat cheeses, by a suitable arrangement. These cheeses are about 20 inches in diameter and weigh about 12 to 13 pounds.

These discs are hard and compact, and can be handled without injury. They are taken to a drying stove where they are placed over steam

pipes, and in about 48 hours are thoroughly dried, ready for drawing and spinning.

The floor space occupied by the complete dyeing machine is about 26 feet by 16 feet. To drive a machine of five sections as before described, 1½ to 2 indicated horse is ample. For the range as described, one man is required for mixing the dye materials in cisterns on an overhead stage, and one man with two youths are sufficient to look after the working of the machine. Where several ranges are installed in the same room, the labor of each is rather less. It is found that from 650 to 700 pounds of dyed cotton sliver, 0.16 counts, in the ordinary colors, can be produced per day of 12 hours in a machine of five sections. This machine is used very successfully for dyeing almost all the ordinary colors, including aniline blacks and indigo. The dyeing is said to be very regular, as the liquor is mixed in elevated cisterns to the strength required and added automatically to the dye-bath at the same rate that it is absorbed by the band of sliver.

The advantages claimed for the machine, are:

1. It is a continuous system working automatically the whole day without stoppage, and can be applied to pretty nearly all colors.

2, The attendance required is very small.

3, Great economy in water and steam.

4, Saving in dyeing sliver over hank dyeing is 15 to 20 per cent.

5, The slivers never being touched or subjected to any operations in the process of dyeing which might injure them, and also being drawn a little through their passage through the different machines, the fibres are disposed in parallel positions not entangled in any way, and can consequently pass through the drawing frame very easily.

6, The dye materials are used very economically and to the last drop, on account of the shape of the dye cisterns, and of their small size, allowing of the use of very concentrated solutions.

7, The results are exceedingly regular through the automatic arrangement for adding dye materials continuously to the vats.

8, Over dyeing raw cotton, there is the advantage that you require to dye 15 per cent. to 20 per cent. less weight, as there is no waste in scutching and carding to allow for. The fibres are kept straight and parallel instead of being entangled as occurs in dyeing raw cotton, and the subsequent drawing is therefore made very much easier. The card clothing is not spoiled, nor are the fibres broken through their having been entangled in the dyeing process, which necessarily occurs to some extent in raw cotton dyeing.

9. The drying is very simple, and the dyed material, because of its compact form in cheeses, may be stored and kept very easily until required. This is an advantage, as it allows of large quantities of the same color being dyed at a time through it not being necessary to work up the dyed slivers until such time as they are required.

Developed Red on Mercerized Cotton.

In view of the well-known increased affinity of mercerized cotton to dyestuffs and mordants in general, the observation that mercerization may also form a very valuable preparatory step to the production of colors on the fibre appears, at the first moment, not to reveal anything but what might have been considered a foregone conclusion. The greater intensity of color attained on a swatch of mercerized yarn, as against that produced on another unprepared swatch, both being taken through the same prepare and developing liquor, would, in the first instance, be attributed to the absorption of a larger quantity of naphtol, followed by the deposition in and upon the fibre of a corresponding heavier precipitate of azo color. The argument might be sustained, even when it

has been shown that the concentration of the preparing bath can be greatly reduced in the case of the mercerized cotton, say, down to one-half of the concentration used in the parallel case, without detriment to the red produced, if the latter is considered a direct function of the amount of naphtol present on the fibre.

This assumption, however, says the Textile Recorder, Manchester, is opposed to practical experience, which has shown that under ordinary circumstances a fuller red is got on a fibre containing 2 per cent. by weight of naphtol than in the presence of 5 per cent., and that, when using 1 per cent. of naphtol only, at least no corresponding diminution in depth of color takes place. Moreover, closer investigation proves that, in the case of mercerized as against unmercerized cotton, the absolute quantity of the red deposited has little to do with the result, the difference being far more one of qualitative nature. It is during experiments undertaken in this sense that one very striking difference between the mercerized and the ordinary fibre becomes apparent. The latter has no pronounced affinity to naphtol; with it the "preparing" process acts entirely in a mechanical manner, and the amount of naphtol fixed is directly proportionate to the strength of, and the amount of, prepare solution retained by, and afterwards dried into, the fibre, the strength of the bath remaining unaltered from beginning to end, no matter what quantity of goods may be passed through it.

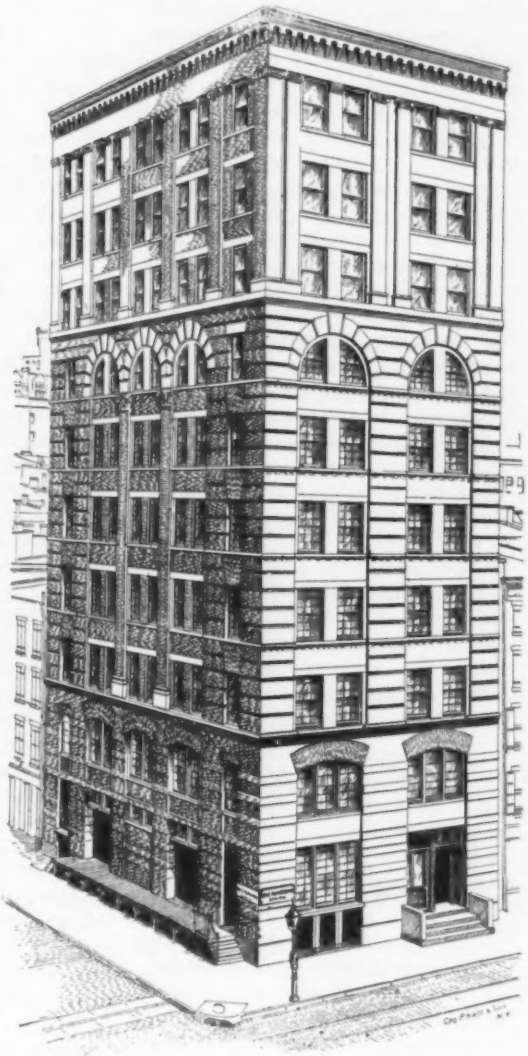
That mercerized cotton, on the other hand, absorbs naphtol as it would a dye, is clearly shown by the regularly decreasing strength and final exhaustion of the bath. It is an easy matter, when working with known volumes of prepare of a given strength and known quantities of yarn, to ascertain indirectly how much naphtol has been taken up, be it by mechanical or chemical attraction, in each case; and the result of careful observation, namely, that 1 per cent. by weight of naphtol on mercerized yarn yields as deep a red as twice the quantity on unmercerized yarn, in the absence of any reason to doubt that copulation takes place as neatly in the one case as in the other, proves conclusively that the tinctorial effect is far more dependent upon the manner in which color and fibre are connected than upon quantities merely. Such closer association is, under all circumstances, brought about by drying the material after grounding with naphtol; without this a very weak red results, though there is but little color lost into the developing bath.

The closer union effected between color and fibre, in the case of mercerized cotton, finds further expression in the greater brilliancy and blueness of the shade and in increased fastness to friction and to light. As to the practical value of the process, the extra cost of mercerization may well be recovered by the saving in prepare and developer, both of them being used at half the customary strength. A much more serious item, however, particularly with piece-goods, is the shrinkage, amounting to from 16 to 25 per cent. in length, and as against this the improved quality of the red alone is hardly a sufficient off-set, except perhaps in the case of yarns destined to replace the genuine turkey-red article. Unfortunately, the desired effect is not attained when mercerization is effected under tension, or when the mercerized yarn or fabric, whilst in a suitable condition, is by mechanical means, restored to its original dimensions.

—New processes of dyeing are continually being described in the technical journals. In all progressive dyeworks these are always carefully experimented with, first in the laboratory, and then, if the results obtained indicate that the process may be useful, on a larger scale in the works. All such trials must be done carefully by a chemist, and not left to any laborer who, through want of care, might obtain results which would condemn an otherwise excellent process.

A Model Dye-stuff Building.

William J. Matheson & Co., Ltd., New York, are among the best known dyestuff houses in this country. They have recently removed from 178 Front St., into their new office and warehouse building, 184 Front St., New York. We take pleasure in giving, herewith, an illustration of their new building, all of the floors of which are occupied by them, except one. The building is considered one of the best erected by any dyestuff concern, in the way of conveniences for this particular business. The first floor is devoted to the shipping and receiving office and room. The basement, second, third, fourth, fifth, sixth and seventh floors are devoted to the storage of dyestuffs. The eighth floor is rented as offices. On the ninth floor are the general offices and accounting room, private office of the president, treasurer and secretary, book-keeping and correspondence departments of the company. On the tenth floor are to be found the private offices of the salesmen and chemists, also laboratory, sample room and committee room. There are toilet rooms and lavatories on the eighth, ninth and tenth floors, and on the second floor of the warehousing department. The building is fitted with passenger and freight elevators, and pneumatic tubes for packages, connecting all departments, likewise an interior telephone system with nineteen stations, besides a long distance telephone service, connecting the several departments. In the book-keeping department an innovation has been introduced, by which each book-keeper has his own individual safe. The laboratory on the 10th floor is one of the most complete of its kind, and has many features especially designed by the technical men connected with the company. It is exceedingly well lighted both from the sides and from the roof. In fact the building in all parts, has little use for artificial light.



—A small stripe of net leno every three or four inches is the most common arrangement in new styles.

Flax in India.

In answer to an inquiry from a Chicago firm, the United States Consul at Calcutta, writes: Relative to the quantity of flax produced and exported from India, that flax is grown in India exclusively for the seed. In no part of the country is the fibre produced. Experiments have been made for many years with the same result, viz., that it is no proof that a plant can be made to yield fibre because it can be grown in a country. Flax, hemp, and China grass are admirable examples of this fact. The possible area of fibre production of any one of these in India is extremely narrow.

Hemp yields fibre in Russia and other countries, and can not be made to produce the narcotic. In India the very reverse is the case, except in a small portion of the Himalayas, where it yields admirable fibre and no narcotic to speak of.

In some parts of the Punjab and Upper Sind flax is produced, but only for local purposes.

While large areas of flax are cultivated in almost every part of India and Burma, it is grown only for the seed, of which large quantities are exported, and not for the fibre; and there is no flax exported from India.

—History has little to say about the arts of India until the time of its invasion by Mahmoud. It is therefore not surprising that records of such comparatively insignificant matters as cotton or woolen manufactures are wanting.

—The origin of Indian carpets, and of the designs used in their fabrication, are properly the subject of a wide inquiry, involving the genesis of design and its evolution from symbolism, extending in the East to the remotest antiquity.

—There is a peculiar character or complexion in pure Scotch tweeds, which shoddy-made goods never attain, and that character forms the dividing line between the better class tailoring and slop clothing.

Something New Under The Sun.

Here we have something that really seems to be radically new and remarkably efficacious in the way of a fire extinguisher.

It is very fittingly called "Kilfyre" which name, we understand, was suggested by its infallibility in the hands of an adult or mere child when coping with an ordinary fire, arising from any cause whatsoever. It certainly is an innovation in the line of chemical fire extinguishers and presents many advantages for factory use, as well as general fire protection.

Liquid chemical machines, as is well known, consist of a tank partially filled with water in which is usually dissolved a quantity of bi-carbonate of soda which, like any chemical in solution, loses strength; added to this it may in time corrode the machine, making it useless and in some cases, when there is sufficient strength to generate the required gas for throwing the solution from the machine to the fire, the orifice has been closed by the sediment, causing an explosion, frequently attended with serious results. The gas in liquid extinguishers cannot be generated, however, without the use of an acid (sulphuric always being used). This acid is sealed in a bottle at the top of the machine. When emergency requires, it is liberated so that by mixing with the solution of bicarbonate of soda it may form the propelling, as well as extinguishing gas, upon which the machine depends for its fire-killing efficiency.

There are various ways of liberating the sulphuric acid which involve "reading the directions" at a time when its user is working under a high degree of excitement.

"Kilfyre" has no machine, simply an open tube, 22 inches long and 2 inches in diameter, filled with a dry, dust-like material which is all chemical, no water, no acid. The chemical not being in solution is claimed to never lose strength or efficiency, either with age or climatic changes. The manufacturers further claim that exposure to the atmosphere does not af-

fect it, that it can hang in any place, dry or damp, warm or cold, that it will neither freeze nor cake, as its composition is such as to resist moisture; that being absolutely non-poisonous, non-corrosive and non-explosive it works no injury whatsoever to either person or fabric, no matter how delicate or fine the texture or coloring, and the material, as well as its gases, are absolutely harmless to human life. There being no water or acid the usual harm resulting from liquids of any kind, or acids, is obviated and the loss attending the extinguishing of fires with "Kilfyre" is confined solely to the "fire damage."

The dry chemical compound is sensitive to fire (not heat) and when applied it instantly transforms into a gas, expanding many hundred times its volume, cutting off the oxygen, thus killing the fire as instantly as it is applied, which, in any ordinary case does not exceed three seconds. This seems a particularly strong point for "Kilfyre," when we know that the more quickly a fire is extinguished the less property will be consumed; while the absence of damage attending the extinguishing of the fire materially emphasizes the point.

No mechanical aid of any kind being required in the application of "Kilfyre" makes it simplicity itself. The material can easily be thrown from the tube a distance quite sufficient to reach any fire; is so light and fluffy that the draft created by the fire itself assists in drawing the powder where it is needed. This feature makes the extinguisher particularly valuable in chimney or flue fires, since one need throw but a handful in any opening on a level with, or below, the base of the fire, thus obviating the necessity of climbing to the top of the flue with liquids and laboring with questionable results.

The sole owners and manufacturers (Monarch Fire Appliance Co., of 27 William Street, New York,) are, for the sake of argument, willing to admit that all liquid chemical extinguishers are good in a degree when new and fresh, since in liquid chemical extinguishers the water acts solely as a carriage to convey the chemical from extinguisher to fire (all of which their makers claim), hence "Kilfyre" all dry chemical (no water) must be just as many times better as it has chemicals in excess of other extinguishers.

Finally they make the broad and aggressive claim that "Kilfyre" will put out any blaze from any material in quicker time, at lower cost, with less injury, with greater ease and efficiency than any other chemical extinguisher, that it is simple, always ready and will never lose strength, and they challenge refutation.

It seems to us that granting these claims to be true, it has strong claims to consideration for mill use. The attention and care which has to be given to the inspection of the fire buckets, and other hand appliances might be lessened, and best of all, in case of fire one has only to follow the natural instinct of throwing it at the flames. The freedom from injury to fabric and machinery is another good point. The most exacting tests have been made under the direction of fire and insurance officials and as the price is only $3.00, it can easily be tried without much expense, and without waiting for an emergency.

Uniform Cotton Bale.

LIVERPOOL COTTON ASSOCIATION — UNIFORM SIZED BALE — MARKING — BETTER COMPRESSION AND BAGGING DEMANDED.

The Liverpool Cotton Association has addressed the following communication to the President of the New York Cotton Exchange:

This Association learns with great satisfaction that a movement is on foot throughout the cotton-growing States to adopt a uniform-sized bale. We understand that experiments have been made by various associations, resulting in the recommendation of an alteration in the size of gin boxes to a measurement of 24 by 54 inches, which will enable bales to be compressed to a density of 38 to 40 lb. against a density of 27 lb. in the pres-

ent sized bales. This Association most cordially approves of this recommendation, as it is strongly of opinion that if the proposal is adopted it will most effectually preserve the bales during transportation, and enable them to be brought to their destination in a comparatively sound condition, and not in the ragged and maltreated state they too frequently arrive at present. In connection with the packing of cotton, this Association desires to draw attention to the "marking" of bales and to the quality of the canvas used in packing. With regard to the marking of cotton, your Exchange is requested to use its influence to urge the desirability of greater care being taken than at present. It is highly desirable that every shipper should put a distinct stencil brand on each bale, for then, should the class mark become illegible, there would be no difficulty in identifying the property, and it would also be a distinct advantage to have the bale marked on both sides, so that if one class mark became obliterated by accidental damage, the other might still be made out. As regards canvas, there is no doubt that the bales should be covered with canvas other than that in use at present. It is true it is heavier now than formerly, but this increase in weight is not the result of a closer, better woven canvas, but simply of increased thickness of the warp, leaving the woven twine pretty much as it was. The canvas is thus more open, and takes the mark no better. What is wanted is a closer texture, which would carry the marks more clearly and give the cotton itself better protection. It cannot be too strongly urged upon the planter and the merchant as regards the pressing, covering, and marking of bales, that it is directly to their interest to do everything within their power to enable cotton to arrive at its destination in the best possible condition—the less waste there is the more the buyer on this side can afford to pay for cotton; the more clearly marked the bales, the less inconveniece and loss he suffers, and in fixing the allowances he has to make between American and Liverpool prices, all these points have to be taken into consideration. This Association therefore most heartily desires the success of the movement on foot for the adoption of a uniform sized and better compressed bale, and ventures to hope that your Exchange will do everything in its power to accomplish the end in view, and also to induce the use of a better quality of bagging, and a more careful system of marking and branding bales.

Cotton Market.

We quote middling uplands, at present writing, at 6 1/16 cents, against 6⅜ cents per pound last month. At the current price, the market appears to have reached a resting place, and there is an unwillingness on the part of the trade of anticipating a much further decline, at least until the coming critical period of the crop has past. Though prices have declined, they could easily rally on any demand for contracts. Business is moderate and unattractive. The growing crop is making good progress, and weather conditions seem to be generally favorable. The conditions in Texas are particularly promising. Of course, it is altogether too early to predict the size of the coming crop, still it is evident that conditions, as they exist today, are favorable to a yield as large as that of last year. The Egyptian cotton market is represented as quiet in Alexandria, with rather lower prices. In Liverpool, the demand for Egyptian cotton has been limited, and holders have met it freely at previous rates, with quotations, however, remaining about the same. Ellison & Co., in their report, represent the Manchester yarn and piece goods market as being uneventful. The tone has been quiet and the sales barely up to the rate of production, but the large forward contracts previously in hand have kept the spindles and looms fully at work. Prices for goods are in sympathy with the decline in the raw

material. The deliveries to English and Continental spinners during the last nine months, ending June 30, on the basis of 500 pounds to the bale, have been 2,791,000 bales, against 2,614,000 last year, in Great Britain, and 3,977,000, against 3,542,000 bales, last year, on the Continent. The surplus stock June 30 was 90,000 bales more in Great Britain than at the same time last year, and 236,000 bales more on the Continent.

Wool Market.

There has been an improvement in the tone of the wool market within the last month, and manufacturers are looking around more for a supply, hoping to find lots at concessions, but it has been their experience thus far to find few such lots; in fact, all desirable wools are held at old prices, without any prospect of a concession, but rather an advance, to meet the conditions that exist abroad, as depicted in the late London sales, which show an advance of 10 per cent. on merino grades. Some of the large mills have taken hold in the purchase of large lots, in some cases approximating 100,000 pounds. The recent sale of South American crossbreds, to the extent of 700,000 pounds, one-quarter blood and Lincoln, has been the occasion of comment. The woolen goods trade will hardly bear the advance in the price of the raw material, and the only apparent salvation for the manufacturer is an advance in his own product. Wool is held at high prices in the country, the interest being chiefly centered in Montana, where the competition is represented as being particularly active. Australian wools are looked upon as being good property, even at current prices, and some are free in their predictions that such wools will see two to three more cents paid for them before the fall months are far advanced. XXX Ohio is selling at 32 to 33 cents in the grease, and X at 26 to 27 cents. Territory wools are selling on the scoured basis of from 45 to 47 cents. The prices for domestic wool are still 10 to 15 per cent. below the importing point. We have been asked in regard to the relative price of body fleece wool and skirts, from Buenos Ayres. We think, that, generally speaking, skirts, or bellies and pieces, may be quoted at one-half the price of body fleece. For instance, skirts are worth 7 cents, and the body wool 14 cents. This conforms to the market report for River Plate wool at Liverpool.

Germany's Sympathy for the United States.

The following letter has been received by us from a German merchant dealing in wool, cotton, knit and embroidery goods. We commend it to our readers as an evidence of the good feeling that the Germans entertain towards the United States in our relations with Spain.

Editor Textile World:

At the present state of affairs, following the news of American victories, I cannot abstain from addressing you and expressing my sympathies with the country in which I have spent a portion of my life. At the same time, I desire to say that the German people entertain a sympathetic feeling towards the people of the United States, our Cousins, if I may be permitted to say. I cannot quite understand the false representations made by the American papers in regard to the feeling of Germany towards your country. Our Emperor, whom all Americans know, is a perfect gentleman of knightly character, who never would break his word, which he has given as to the position of Germany in your war with Spain. We Germans are waiting for an early close of the war in favor of the United States, a close which could not be otherwise.

Wilhelm Bieger.

Oschatz, Germany.

—In the country districts, and to some extent in Belfast, Ireland, itself, hand embroidery and fine hemstitching is still done in the homes. But in Belfast, generally, the tambourers or flowerers are replaced by women and girls employed in factories in making shirts and collars with machinery driven by power.

COTTON DEPARTMENT.

Mechanism of a Fine Spinning Mule.

WILLIAM SCOTT TAGGART.

(Continued from June.)

Our last article closed with the statement that under certain circumstances an extra winding motion, exterior to the quadrant, is found to be serviceable in giving a few extra turns to the spindle as the carriage is finishing its inward run. Reference is made to Fig. 8, (June issue) and to Fig. 9, herewith, from which the action of the motion will be easily understood.

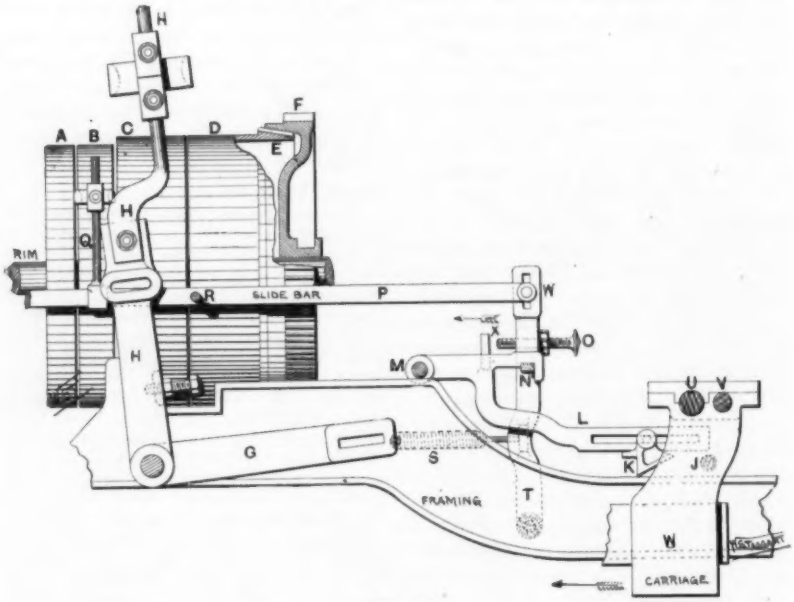


FIG. 9.

As the carriage come in, the mule driving strap is running on the loose pulley "C" on the rim shaft, and drawing up is being effected by the strap on the pulley "B" as shown in Fig. 6 (June issue). On the rim shaft are placed two other but narrower pulleys "A" and "B," one of which, "A," is keyed to the shaft; whilst the driving strap is therefore on the loose pulley "C," the extra strap is working on the loose pulley "B." In other words, the rim shaft is quite stationary as the carriage runs in. As the inward run is being completed, a pin or bowl "J" on the faller stand, comes in contact with an incline "K" which is pivoted to a lever "L" centred on the stud "M." The bowl "J" in passing under "K" lifts it, and in doing so lifts a projecting catch out of contact with a slug "N" on the lever "T." When the lever "T" is in the position shown in the illustration, the spring "S" attached to the framing at one end and to "T" at the other end, is in tension, immediately "N" is released by the lifting of "L," the spring "S" pulls the lever "T" over in the direction of the arrow. The amount "T" can be moved forward is regulated by the screw "O" so that a movement can only take place to the extent shown at

"X." By increasing or diminishing this space, the movement of "T" can be carefully regulated.

Attached to the upper end of "T" at "W" is a slide bar or strap fork link "P," and on this bar is fastened the strap fork "Q" through which the strap passes which drives the pulleys "A" and "B." The movement of "T" is therefore transferred to the strap fork "Q," and in this way the rim shaft can be set revolving before the carriage reaches the back stops. By means of the slot in "L" the position of the tumbler incline "K" can be set so as to be inoperative, or so as to be acted upon up to 8 inches from finish of the inward run. In the same way the screw "O" enables one to keep the strap always on the loose pulley "B," or it can be so set that any portion of or the full width of the strap can be made to pass on to the fast pulley "A." It is this convenience in adjustment that makes the motion so valuable in dealing with delicate yarns and high counts. When the slide bar "P" is moved forward, a pin "R" fixed to it, is brought near to or in contact with the main strap fork "H." When this strap fork is changed, in the usual manner, for the purpose of driving the spindles and taking the carriage out, it pushes the slide bar back and causes the lever "T" to again become locked at "N" and at the same time the winding strap is moved from "A" to the loose pulley "B."

The well known Lancashire terms "gain" and "ratch" are now almost invariably associated with fine spinning, though the first one used to be frequently met with in medium and even low numbers. Both terms are simply expressive of two different methods of obtaining the same effect, namely:—lengthening the yarn by a stretching action, and in the use of long stapled cottons, such an action is almost indispensable if the highest quality of yarn is to be obtained from the cotton. The reason is not far to seek. In spite of all the preparing processes being designed to lay the fibres parallel and adjacent to each other, and also as regular as possible in length and quantity throughout the sliver

Fig 11

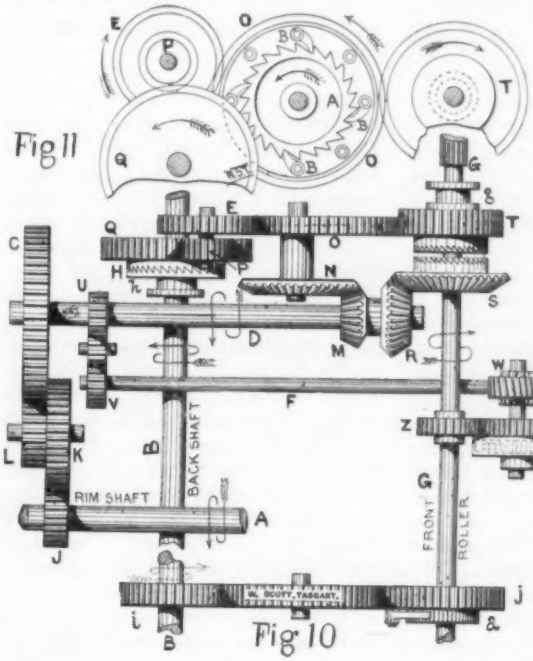


Fig 10

Fig. 12.

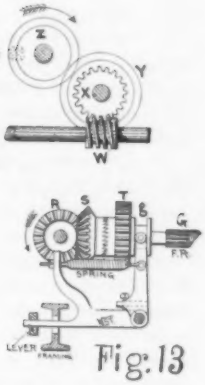


Fig. 13

and roving, a little thought or observation will show us that so long as the fibres are perfectly free amongst themselves they will always tend to assume the wavy or curly form they had when in the cotton boll. This is purely the effect of the natural elasticity in the fibres and it is this fact that causes some little trouble when very fine numbers are being spun.

It will clearly be seen that whilst "drawing" will produce a high degree of regularity up to the point of spinning, it can scarcely have more than a perceptible effect in overcoming the difficulty just mentioned. On the other hand, there is no difficulty in understanding that if, when these long fibres are twisted together to a certain extent, a stretching action is given to the yarn, the fibres will be drawn along each other and straightened out and their twisted condition will keep them in that position. We also know that an increased regularity of diameter for the yarn is obtained if yarn is stretched as it is being twisted. It is a well known mechanical principle that the twist put into yarn will always fly to the thinnest part. Unless, therefore, the yarn is mathematically perfect there will be irregularly twisted places in the yarn. Stretching during twisting has a very beneficial effect because by it we are able to draw out the thicker places until the twists will distribute themselves more equally along the thread. Long stapled cottons enable this stretching to be done to a large extent without injury, but there is a limit, outside of which some of the advantage would be lost and as a consequence, the stretching is divided into two parts and two distinct methods adopted in obtaining it, both summarized under the term "gain and ratch."

Figs. 10 and 11 will illustrate both actions, or at least the gearing through which the actions are controlled. The outward journey of the mule carriage is primarily brought about through gearing from the rim shaft "A," but, as will be noticed, from the drawing Fig. 10, it is essentially controlled from the front roller "G." The front roller is driven through the wheels "J K L C R" and "S," and from this gearing it will be at once seen, that the bevel wheel "S" must be loose on the front roller and therefore can only be operative when the catch box on "T" and "S" is put into gear. This enables backing-off to take place and twisting at the head without the front roller moving. During the run out, the wheels "T" and "S" are in gear as shown in the small side view in Fig. 13, and this being so, the train of wheels from "T" to the back shaft, viz: "T O E P" and "Q," will cause the front roller to drive the back shaft "B" through the clutch box "H."

Now in "gain," our object is to cause the carriage to have a greater speed in going out than the surface speed of the front roller which delivers the roving, and by means of the compound carrier "E P," we are able to make these two speeds differ by whatever is considered sufficient or desirable. Beyond a certain point it is not advisable to carry this stretching action simply because, as we see, the effect is being produced when the mule starts out from the roller beam, and here there is only a very short length of yarn to be acted upon, and yet it has the same gain that the longer length has when the mule is well out. This is the chief consideration that fixes the limit, so that when say six inches have been gained in this way, the rollers are stopped by disconnecting the clutch box on "S" and "T," and the carriage finishes the last two or three inches without the rollers delivering any cotton. This last action is called the "ratch" in the factory language of Lancashire, but otherwise it is known as a "jacking" motion and also as the "after stretch."

The sketch will explain how it is obtained. A bevel wheel "M" on the side shaft "D" gears into a larger bevel wheel "N" mounted on the same stud which carries the wheel "O." On the boss of "N" is fixed a ratchet "A" (Fig. 11), and into the teeth of this are fitted a series of pawls or catches, say eight, four of which are shown at "B," whose studs are carried by the wheel "O." Whilst the front roller is revolv-

ing, the wheel "T" drives "O," as it drives the back shaft; at the same time "N" and "A" are being driven by the bevel "M." But since "O" is driven faster from "T" than from "M," and in the direction of the arrows, the catches "B" will simply slip over the teeth of "A," and consequently the driving of "M" is non-effective. But when "T" is put out of gear with "S," the bevel "M" continues to revolve, and this causes the ratchet wheel "A" to come into contact with the catches "B," and so force round the wheel "O," which carries them. From "O" the back shaft will then naturally be driven, although the front roller is stopped, and this will continue until the carriage stops through the catch box "H" on the back shaft "B" being put out of gear by the changing mechanism just before backing-off takes place.

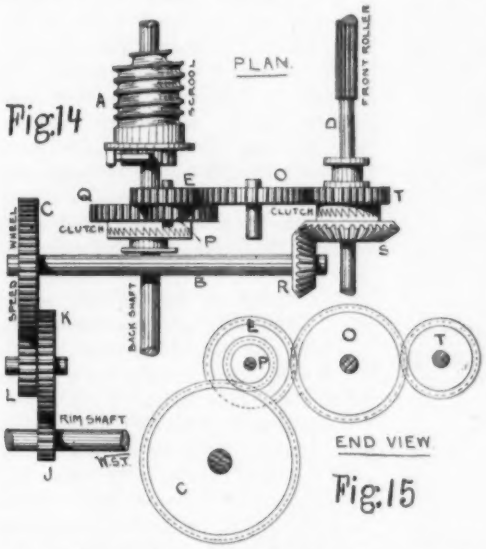


Fig.14

Fig.15

Fig. 10 also illustrates another motion associated with fine spinning, viz: "a roller motion whilst twisting at the head." The object of this motion is to relieve the yarn during the jacking operation and the twisting at the head and so to prevent the excessive tension in the yarn from causing breakages. The large amount of twist put into the yarn together with the "gain and ratch" produces a high tension which is extremely dangerous to the yarn. So, to avoid breakages, the rollers are caused to deliver a small amount of yarn to relieve the strain. It used to be the practice to cause the carriage itself to come back a very short distance to obtain this effect and from this we got receding motions. But such motions at the best are purely makeshifts and clumsy methods to adopt. The sketch illustrates a far better and more simple method, and one that meets with greater favor than any receding motion.

Alongside the shaft "D" is geared another side shaft "F" through the wheels "U" and "V." On the end of "F" is keyed a worm "W" which gears into a worm wheel "X" on the stud of which is a ratchet wheel "k," into the teeth of which gear a catch carried by the wheel "Y." From "Y" the front roller "G" can be driven through the wheel "L." See also end view in Fig. 12.

When the front roller is being driven in the usual manner, "H" will drive "Y" and at the same time the ratchet wheel "K" will be driven through the wheels "U V W and X," but owing to the quicker speed of "Y" over the speed of "K" the catch in "Y" will be out of gear with the teeth of "K" so that the front roller is not affected through this gearing. Whenever the front roller stops however, the movement of the ratchet causes the catch on "Y" to come into contact with the teeth of the ratchet "K." "Y" is then caused to revolve and with it, of course, the front roller. The movement thus given to the front roller is very slight, not amounting to more than 1½ inches, whilst on the other hand it can be so set as to only give an additional movement equal to a single flute of the roller. The "change" made at the termination of the outward run stops this action as it also stops the back shaft, and it remains inoperative until the next run

out takes place. A still further delivery of yarn takes place in spinning fine numbers. This is done whilst the mule is making its inward run; and is known as the "roller delivery motion whilst winding." It serves the double purpose of relieving the tension of the yarn and of increasing the production of the machine. It is a very simple arrangement, as can be seen on reference to the sketch, Fig. 10. The front roller is driven from the back shaft "B" through a train of wheels "i to j." The back shaft is driven during the run in from the large scroll shaft, and the wheels "T and S" are disconnected. The wheel "j" is free on the shaft and carries a catch which under the ordinary revolution of the front roller is out of gear with the ratchet wheel "a" which is keyed to the front roller "G". During the run in, however, the front roller being stopped (so far as being driven from the rim shaft is concerned), the back shaft drives "J" and its catch engaging with the ratchet "a" drives "G" and causes the rollers to slowly deliver, say, 3 inches of yarn, as the carriage comes in. For fine spinning this is a decided advantage and even for lower numbers it is by some considered an advantage, but it is not so general for this purpose, especially for medium and low numbers, as it used to be. Figs. 14 and 15 are added in order to show the difference between an ordinary mule and the fine spinning attachments we have been considering.

To be continued.

—The number of power-loom weavers in northern Ireland, has always been considerably less than the number of power-looms, and, as late as 1875, the hand-loom weavers in Ulster were much more numerous than the power-loom weavers.

—At the present time (1897), in the whole County Antrim district, Ireland, manufacturing hand-loom goods (including the east border of County Derry), it is estimated that there are about 1,000 hand-loom weavers. The earnings are very small.

Principles of Cotton Spinning.

ROBERT CUNLEFFE.

Of course it must be admitted that any variation in the detail of carding machines must to a certain extent, affect the production or quality of the work done. Too often in these machines, quality is often sacrificed to quantity. In fact, that remark applies to cotton spinning all through. The keen competition there is in the cotton trade has tended to increase speeds and production. Weight must be got off whatever the quality; and whether it be increased speed or an extra weight of lap, the result is the same—badly carded, rough and cloudy yarn.

The principal work performed by the carding engine has too often been considered a sort of mystery, from the fact that the action of the various parts of the card cannot be seen; and remarks are too often made, as to what takes place in the process of carding that has no foundation in fact. Yet there ought not to be any real difficulty in tracing the actual work being done, and the various alterations and conditions that the cotton is subjected to, from the feed roller to the doffing comb.

We will now endeavor to dispose of some of these mistaken notions. Many good practical carders with whom the writer has had conversation, yet who have not studied the theory of carding sufficiently, speak as if the lap, (which is about one fiftieth part of an inch) as it unrolled at the back of the card, was placed on the wire of the card in that condition, and speak of layers of cotton and the thickness of the wire on the cylinder. By a little thought, we shall see that these are very erroneous ideas indeed, and that there never is such a thing as layers, nor can we speak of thickness of cotton on the wire of the card cylinder; as the cotton on the cylinder consists only of a small number of fibres with relatively large spaces between. The lap is placed behind the card and turned in by a feed roller running about 1¼ revolutions per minute, and

being 2¼ inches in diameter, would deliver, say, 9 inches per minute. This is delivered to the lickerin running at about 800 to 900 feet per minute. Thus we see at the commencement what a great change must be effected here, and the lap with its fibres crossed in all directions must be brought somewhat into parallel order. We can easily see for ourselves what is being done here before we get to the cylinder.

Stop the carding engine or the feed and delivery, (which can easily be done by simply taking out a pin at the end of the side shaft) and turn the feed roller back until we can see the end of the lap. We shall see, first, that the fibres are approximately parallel; and, second, that the cotton is not being taken forward in a sheet anything like the thickness of the lap, but that this thickness is gradually tapered down from the full thickness to almost individual fibres, and that the teeth of the lickerin are only taking the cotton, almost fibre by fibre, and conveying it in that way to the main cylinder, where once more it is drawn out; for the main cylinder will run at about twice the circumference speed as the lickerin, namely 1600 to 1800 feet per minute. Besides this, the wire on the main cylinder is very much finer than that on the lickerin, the numbers of wire on the lickerin being about 8s, whilst the cylinder is about 120s. Now if the cylinder be 50 inches in diameter and 40 inches on the wire, and covered with No. 120s wire, we shall have the number of points of wire passing a given place, each revolution of the cylinder, as follows: $50 \times 120 \times 5 \times 40 \times 22/7 =$ 3,771,428, number of points of wire each revolution.

Now it is computed that a lap of about 10 oz. per yard in length, will have about 50,000 fibres on the wire of the cylinder at one time. Thus we see, that there are a vast number more points of wire on the carding cylinder than there are fibres of cotton. These fibres from the cylinder are next deposited on the doffer teeth, which are still finer, more points in each inch than those on the cylinder. But the doffer runs at a much slower speed than the main cylinder, only about 75 feet per minute, thus the cotton is condensed, as it were, upon leaving the main cylinder for the doffer. The doffer is clothed with about No. 140s wire. The diameter of the doffer is 24 inches, and like the cylinder, 40 inches on the wire. Then we have $40 \times 5 \times 24 \times 40 \times 22/7 =$ 2,112,000 points of teeth in each circumference of doffer. But as the doffer only makes 75 feet while the main cylinder makes 1600, we shall see that the cylinder will be depositing the fibres from itself to the doffer much more quickly, and consequently much more densely; and the wire of the doffer will have more cotton than those of the cylinder.

In the opinion of many practical carders, the most important work of the card takes place between the cylinder and doffer. At the front of the doffer is a comb making about 1,000 to 1,200 double vibrations per minute, thus stripping the cotton from the wire of the doffer, when it is gathered by guides and passed through a trumpet-like funnel, having a hole about one-half inch diameter, which forms a sliver ready for coiling into a can.

Thus far we have been trying to show that the prevailing idea regarding the quantity of cotton on the wire of the cylinder at any one time is erroneous; but, on the other hand, there are more points of wire on the cylinder than there are fibres.

We must now come to speak of the different parts of a card; and we shall deal with the flat card, as we have said, this card is now almost universally used. We must retrace our steps somewhat in order to refer to the working parts, and also point out the best means of working and setting the various parts. The method adopted in all modern cards to bring the end of the lap in range of the action of the lickerin is by the dish feed. With the dish feed nose properly shaped and set, and the teeth of the lickerin formed aright and sharp, there is a

more perfect action, and less injury is done to the fibres, than by the old method. We have referred to the action of the lickerin, as that of dealing more with individual fibres than with any bulk. In fact, the action of the lickerin teeth should be one of combing out the end of the lap, thus detaching the fibres without running the risk of damage. To obtain this action, the dish feed plays an important part. It is necessary to secure good carding, that the teeth of the lickerin should only remove those fibres which are liberated by the feed rollers, and with the dish feed, only those fibres which are projected over the plate or nose can be removed. It will be obvious that there must be a greater length of lap between the nip of a pair of rollers, and the extreme point of the projecting part of a lap, than will be from over a dish feed plate. In other words, the teeth of the lickerin have less material to pull at, and therefore more likely to take the fibres away in detail.

The saw tooth wire of the lickerin, if properly made and put on, never require stripping, and is always sharp. But the full advantage of the dish feed is only obtained when the fibre is struck from a specially shaped surface, and set to suit the staple of cotton which is being worked. When a short stapled cotton is being worked, the space between the tips of the lickerin teeth and inner face of dish feed is very small, and the projection of the fibre over the nose of the feed plate is immediately followed by the combing action described above. As the staple of the cotton becomes longer, the extreme end of the fibres can be attacked at a greater distance from the nip of the feed roller, and, it being desirable to comb out the cotton as described, the nose of the dish plate is shaped to allow of this being done.

As the feed roller continues to carry the cotton forward, the teeth of the lickerin seize hold of those fibres which are sufficiently liberated, and in carrying them to the cylinder they pass over two knives, called moat or dirt knives, fixed under the lickerin, and also past the undercasing to the point of contact of the cylinder and lickerin. In this passage much good work may be done, nearly all leaf can be extracted and unripe or dead cotton, sand, etc., taken out without doing any damage to the fibre.

There is no doubt but that the dirty carding and excessive waste made in many mills are attributed to the bad setting of the dirt bars and undercasings; and many managers in Continental mills, knowing this to be of much importance prefer to set these knives and undercasing themselves. The angle of the knives and bars in the undercasing, and the distance between the points of the lickerin teeth and the knives and bars, are of great importance, prefer to set these knives the requirements of the staple of cotton being used. Now, the cotton being taken away by the lickerin, and presented to the cylinder, and, as we have shown, taken in detail by the cylinder, it will, to a great extent be stretched and parallalized; and this, simply owing to the difference in speed, together with the greater number of points of wire of cylinder over lickerin, will be fairly equally distributed over the working surface, and will have lost most of the heavy dirt and leaf. But it is still curled and twisted, and short cotton or unripe fibre is still with it, and also neps. These must be taken out by the other parts of the card, or otherwise inferior yarn will be the result. These we will deal with in our next.

Jacquard Designs.

Two suggestions for jacquard designs are represented in Figs. 1 and 2. Fig. 1 can be made on 400 ends and picks, and Fig. 2 on 200 ends and picks, with counts as required.

In selecting a sketch for a jacquard design the one is always selected that is most suitable for the fabric, it is intended to make, and also for the taste of the market. The arrangement of the sketch or pattern depends upon the effect it is desired to produce. If

our pattern is required to have a "liney" effect, that is where the figures run in lines or rows, and where a straight line can be drawn between them; or if our patterns are to cover each other so that no "liney" effect will be produced, we shall have to so arrange them to give us the effect desired.

Now, supposing that we have selected our sketch and it consisted of two figures turned in opposite directions, and that we desire the effect to be "liney," we shall then rule out a square according to the measurement of the pattern and divide this into four equal parts and insert the sketch as shown in Fig. 1.

If, again, we have a sketch and it is desired that there be no "liney" effect, then the sketch will be measured as in the previous case and the squares made accordingly. Now, as we have seen that to produce a "liney" effect the divisions of the ruled square must be at least the full size of the sketch, therefore to produce an effect where there shall be no lines we must have the divisions actually less than the sketch, so as to allow some parts of it on every side to cover the lines, as illustrated in Fig. 2. In reducing the size of the divisions of the square, care must be taken that these are made and ruled to correspond with the design paper.

Another method of arranging patterns in this order is given in Figure 3, where the figures seem to be more distributed and a more "all over" effect is given. In the first place the squares are ruled out according to measurement and on each of the four outside squares a pattern is inserted, as will be seen. The centre pattern is then put in and the full size of the repeat of the pattern is then ruled on each side of the centre one, in this case 2½ inches. The lines first made can then be erased, leaving the full pattern almost ready to be transferred on the design paper. In arranging the patterns in this way, extra care is required so that the patterns will join in correctly at the corners. Before transferring the sketch on the design paper, it is ruled into a number of divisions and the design paper is also marked to correspond. For instance, the sketch given in Figs. 2 and 3 occupies

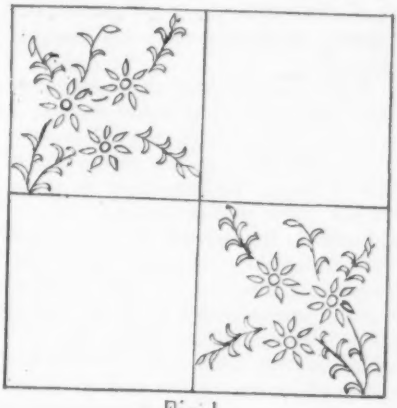


Fig. 1

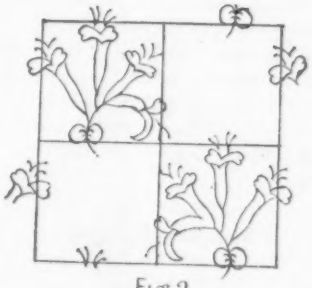


Fig. 2

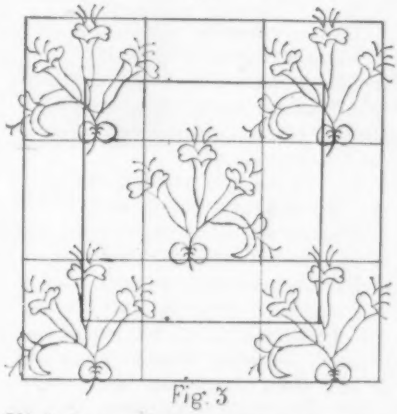


Fig. 3

2½ inches, and if this space is made in ten equal divisions, of ¼ inch each the design paper will also have to be divided into ten equal parts to correspond, which will give 20 small checks both ways.

The sketch is then transferred on the design paper, making the two to correspond as near as it is possible to get them, for it must always be remembered that the more perfect the sketch the more perfect will the pattern be.

If the patterns have to be enlarged, this can be done by either making a larger sketch or by making the enlargement direct on the design paper. By working on the latter principle much time will be saved for the checks on design paper will only need be marked to corespond with the divisions on the sketch. Take, for example, the patterns given at Fig. 2 and 3, and it is desired, say, to make them on 400 ends, then by using the same divisions on the sketch, as before, we should mark off 40 checks on the design paper both ways. If this be too many and the sketch cannot be so easily and perfectly transferred, then the sketch could be ruled into twenty divisions and allow the same number of checks on design paper as when transferring on 200 ends.

THOMAS.

A New Textile School.

ON THE CORRESPONDENCE SYSTEM, WITH C. P. BROOKS AS DIRECTOR.

The announcement has been made of the establishment of a new textile school on the correspondence system with Christopher P. Brooks, the late director of the Lowell Textile School, in charge.

Mr. Brooks, who has had charge of the Lowell Textile School since it was first organized, and who has brought it to its high state of efficiency, resigned his position the early part of last month, and at once entered upon his new duties. As a mill superintendent of many years' experience and having been connected with textile school work for fifteen years, there is little doubt that the new institution will be a success.

There are undoubtedly in the mills, workshops, mill engineers' offices, and dry goods commission houses of other cities, many men and women who would like to take advantage of a textile school education but who are unwilling to leave their positions to do so. This has been noticed by several textile men and with Mr. Brooks as principal, the American Correspondence School of Textiles has been established.

Mr. Brooks' resignation will be a loss to the Lowell Textile School which he has given almost an international reputation in less than two years.

The new arrangement will leave Director Brooks free to supervise other textile schools and he has already accepted an appointment as consulting engineer to the Georgia School of Technology, Atlanta, Georgia, and will design and supervise the construction of the new school at Atlanta and organize its staff. He is also being consulted regarding the establishment of a similar institution in Canada.

The headquarters of the new Correspondence School, it is understood, will be in Lowell, and it will not in any way conflict with the work of the Philadelphia and Lowell Textile Schools.

—Those interested in cotton compresses, in Georgia and Alabama, recently met at Atlanta, Ga., for the purpose of organizing an association, having for its object the changing of the form of the square cotton bale, or more properly, for establishing a uniform or standard size of bale for the cotton-growing States. This movement was apparently directed by the compress men of Texas, who have been active in an effort to establish the standard size of the square bale at 24 by 54 inches. The purpose, also, of the compress men, is to improve the quality of bagging and the packing of cotton, so that it shall not be subject to so many just complaints on the part of insurance companies and those handling and using cotton.

—The hand-loom industry still survives in the Counties of Antrim, Down and Armagh, Ireland.

WOOLEN DEPARTMENT.

Science and Practice of the Construction of Woven Textures.

F. BRADBURY.

DRESSED FACED CLOTHS—UNIONS.

(Continued from July.)

The materials of which these fabrics are composed consist of a cotton warp and a woolen filling, whose quality varies from the product of a pure merino wool, opened, carded, condensed and spun upon the woolen mule principle, down to the lowest yarn composition, such as shoddy, mungo or any re-manufactured product produced upon the woolen process of manipulation.

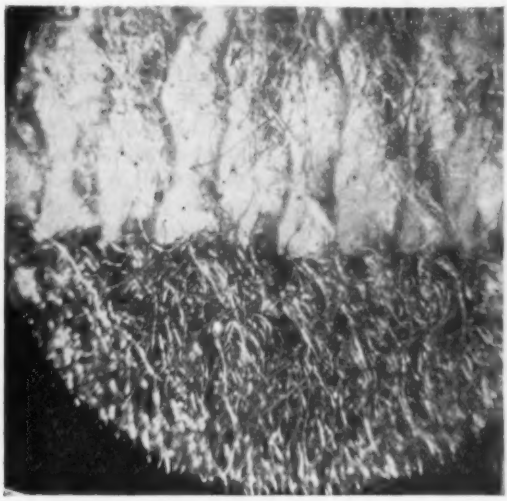


FIG. 26.

The chief aim in the production of a dressed-face fabric is to entirely cover the face of the cloth, including the weave structure, with short fibres which are raised from the body of the texture. These fibres are brushed or drawn in one direction and afterwards cut to one uniform length or thereabouts. Three makes of this kind of cloth are shown, in partly dissected condition, at Figs. 26, 27 and 28 respectively. They are each photomicrographs.

Figure 26 is photographed from about one-fifth of an inch of the actual fabric and enlarged from 15 to 16 times its size, while Figs. 27 and 28 are from about one-third of an inch of material and enlarged from 8 to 9 times the original, a higher objective power being employed in the former case.

Each fabric, of which we shall have much to say later, is represented sufficiently in the illustrations to demonstrate the kind of fabric it is proposed to consider, together with its external appearances. A reference to the illustration makes it distinctly apparent that the surface of the texture is almost completely covered with a dense mass of fibres with little or no weave effect visible.

Since the subsequent processes of cloth manufacture are most important factors in imparting character, appearance and handle to the fabrics which have been selected for consideration, it will be found advantageous for the manufacturer to be acquainted with the processes and purposes in order adopted, of scouring, milling, dyeing and finishing so as to secure the above results. Therefore, prior to any detailed structural analysis of the cloths, we here record a brief description of the several processes just mentioned, and to which the three cloths were subjected.

The cloth is first wet down and scoured in soap and soda and so cleansed from all dirt, grease, etc.,

which has accumulated and adhered to the material during the manufacture, and next it is milled or fulled, the result of which is an increased bulk of fabric, a loftier handle and consequently a decreased length or width, or both, together with a reduced size of pattern (when it is not altogether obliterated). Briefly, this process consists in thoroughly saturating the fabric in water, soap and soda, and then subjecting it to a severe beating and pressing in the stocks, or, more recently, in the milling machines. This operation is materially assisted by the mechanical arrangement of the fibres which compose the weft yarn. Being a woolen thread, the typical arrangement of the fibres is such that the longer fibres lie along the central axis of the thread, while the shorter ones are revolved more or less around this axis and present the tips of their individual fibres in almost every conceivable direction, with the result that when these yarns, afterwards composing the woven fabric, are subjected to the fulling or milling operations, the separate fibres apparantly possess a natural affinity for tenaciously interlocking with each other, and to such an extent that they lose their own individualty and simply appear as a dense mass of fibres as in the woven fabric.

Note: The woolen yarn is only typical or true when it is also even throughout its length, but more will be said on this point when we consider separately the yarns which have been employed in the structure of the fabrics. After the fulling, the fibres are raised out of the cloth by a machine, while the fabric is still wet. The advantage of wet in preference to dry raising, is that the face of the fabric gets more thoroughly disturbed by the severe action of the teazles upon it when passing through the raising gig, and so a sufficient pile or nap is obtained, which, after the subsequent brushing, cropping or cutting, entirely covers the weave element. In the case of dry raising only those fibres which are upon the surface of the cloth are raised so as to facilitate the subsequent cropping or cutting operation, which then leaves the surface of the woven texture bare. Every kind of fibre, long, medium and short, projecting above the surface, is completely removed.

Following the raising, comes the operation of crabbing, the object of which is to impart a permanent set and lustre. The piece is tightly wound upon a cylinder and boiled for a few hours. It is then rewound upon another similar roller so that the end of cloth previously upon the inside nearest the roller, is now upon the outside and the boiling is continued so that the boiling and steaming acts with equal influence throughout the full length of the piece.

The piece may now be dyed, but it must run through the dye vat in the same way as the nap was raised. There are other methods of crabbing, but there is no necessity to consider them here.

A second process of raising, which is only to be slight, has now to be performed so as to facilitate the straightening of the fibres. Tentering which is usually performed several times during the finishing process may now be finally done, its object being to keep the cloth straight, free from creases, and of the required width.

The objects of brushing and cropping, which may now follow, are already sufficiently understood. Finally the piece is pressed off, the aim of which is to produce a texture, the handle and appearance of which will appear of a very solid nature. It also imparts a certain amount of temporary glaze and lustre.

Such, briefly, are the processes through which the fabrics passed which we now propose to enquire more fully into as regards their construction and respective merits.

It will of necessity be distinctly understood that the complete advantages of the operations performed by the fuller, dyer and finisher can only be secured when they are given a fabric which has been constructed so as to leave sufficient field for each operator in turn to perform his work to the

fullest advantage, e. g., a fabric may be set so close in the loom, that sufficient margin is not left for the shrinking properties of the yarn, and consequently the cloth, after the milling operation, is not satisfactory, or, as in the case of union-faced cloths, the threads of the warp may be in a greater relative proportion that those of the weft (or vice versa) than is consistent with the build of the cloth and final result required.

In addition to the foregoing properties, the fabric must be firm and durable. The durable nature is very largely obtained by the weave employed, which, in the fabrics now under consideration, is usually plain, tabby, canvas or melton, as it is variously termed in practice, according to the manufacturing locality. No better weave element is possible for imparting strength, fineness and durability to a woven product. In the attainment of all the foregoing, including the ideal face, there is involved a consideration of many factors. The following are among the chief: 1. The setting of warp threads and the suitable amount of filling, inclusive of the angles formed by these sets of threads as set forth in the conclusions deducted from a study of Figs. 8 to 11a inclusive (see Nov. to Feb. issues). 2. The quality of the filling yarn, including the suitablity of the scribbling, carding, condensing and spinning operations upon the material employed. 3. The fulling, dyeing and finishing operations which we briefly but sufficiently considered.

The reader's attention and study is now invited to the manufacture of the three makes of dressed faced union cloths, a consideration of which reveals some interesting facts connected not only with their appearance, handle and structure, but supplies much important data which will be found useful when circumstances require us to build a class of fabrics of similar description. The quality of the raw material and the weave structure in all three cloths are identical. The manipulation of the raw product into yarn and the manufacture into cloth we shall leave for future consideration. Meanwhile the external properties and appearances may be detailed as follows.

Figure 26 is our ideal texture. It presents to the eye a dense but quite evenly distributed mass of fibres, all neatly lying in the same direction, and producing as perfect a cover as it is perhaps possible to obtain, for the weave structure is entirely hidden from view. To the handle it reciprocates with softness, smothness and agreeableness of touch. It is firm and apparently durable.

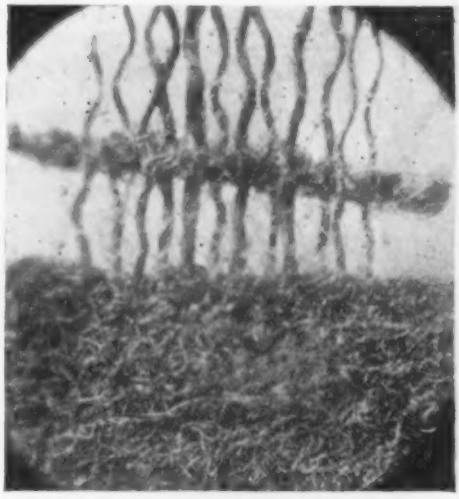


FIG. 27.

Figure 27 represents a ragged and an irregular mass of fibres. The weave element is somewhat visible, fine lines are to be seen across the piece between each preceding and succeeding pick of weft. It is barer, while the handle is somewhat rougher.

Figure 28 is much better in appearance than Fig. 27. The weave effect, as in Fig. 26, is entirely covered. The surface appearance of the fibres,

though not as even as in Fig. 26, do not manifest the same uneven or cloudy effect as Fig. 27, which is probably largely due to the weave effect being hidden entirely from observation. Finally, though the handle is slightly smoother than Fig. 27, it is not equal to Fig. 26. Expressed in the words of a woolen manufacturer it is 50 per cent. better than Fig. 27.

Subsequent reasonings and calculations will demonstrate that from a manufacturer's standpoint the fabric, Fig. 28, has been constructed as well as it could possibly have been, and that any inferiority as compared with Fig. 26 cloth is due almost, if not entirely, to the unsuitability of the machines employed in the manipulation of the raw product into yarn. From the negatives of each of the three photo-micrographs (Figs. 26, 27 and 28), I have made lantern slides and by means of the oxy-hydrogen gas and limelight projected them on to a white sheet so that the original sizes, one-fifth and one-third of an inch of cloth photo-micrographed, appeared in size about 54 inches square, with the result that Fig. 26 cloth had the appearance of a neatly combed head of hair, while Fig. 28 appeared as though the owner had just pushed his fingers through the previously straightened locks, whereas Fig. 27 looked, to say the least, very irregular and unkempt.

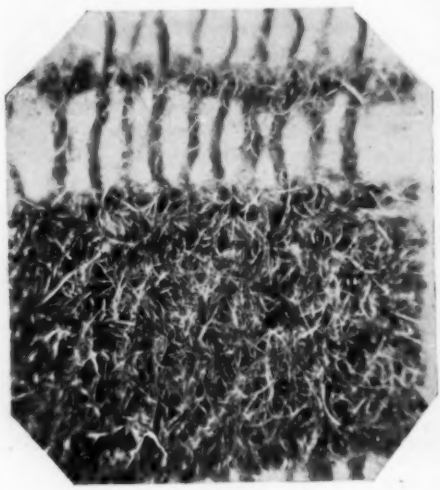


FIG. 28.

To be continued.

New Color Effects on Cloths.

In the usual methods employed for printing on various kinds of textile fabrics, the aim is usually to have the colors and designs as well marked and as clear and distinct as it is possible to make them. The line of demarkation between the different colorings must be sharp and clear, and the design must stand out on its own basis, not over lapping and not trespassing upon the background colors or effects. In most cases, and we might say in all, the printing is confined to one side of the cloth only. This has always been the rule, and any departure from it would be an innovation.

But in these new color effects which appear from certain quarters and which are applicable to all kinds of fibres and fabrics, different conditions prevail. It matters not whether the cloth be cotton, wool, mohair, silk, or mixture, the results are the same and the process produces in all cases satisfactory and pleasing effects.

The intention of the process is to print upon either face or back, or indeed upon both, if need be, the design and colors by means of dyestuffs or mordants or even of both where necessary. The usual printing processes may be employed, all that is necessary is certain devices and alterations which bring about the needed differences in color effects.

The designs that are used are generally simple and as little marked or pronounced as possible, and they may be employed in many different forms and arrangements. Streaks, stripes, dots, and lines variously disposed serve to form the ground work and may be applied to both sides of the

cloth if desired. As to color, the same colors may be used for back and face, or different shades and colors may be used in each case. Indeed two different designs are often employed, one on face and one on back. Thus much for the design so far as its ground work is concerned, but in between the lines and dots, etc., of this ground work, there must still appear the original color of the fabric, and this gives tone and strength to the cloth, and is in all cases a conspicuous feature of the many colored effect. If differing degrees of shade are desired, it may be brought about in two ways, either by diluting the color used in the printing, or by making the lines and features of the design heavier or lighter as the case may require. The deeper engraving of the design on the printing plate will cause a heavier application of color, and the result will be a darker and more pronounced shade in the whole fabric, though in fact the colors themselves are unchanged.

In order to insure the durability of color and design and in order that the colors may stand the wear and tear of the remaining operations upon the goods, it is necesary that every precaution be taken to make the colors fast. Only fast colors are used in the first place; and then they are carefully set by the steaming process, and by any other method that may be available which will serve to fix and render stable the complete proportion of color employed in the printing. The cloth has got to undergo quite a severe course of treatment even after the coloring and printing has been done, and in order that this treatment shall not cause any bad results in the coloring, as much time must be taken in the printing, and the process must be as gradual and as thorough as is consistent with reasonable possibility.

Now another feature of this peculiar class of goods comes to the surface. After the printing on one or both sides is done, the next thing is to so handle the goods as shall have the effect of changing the position and lay of the fibres which enter into the constitution of the cloth, and which appear in the colored surfaces and design. This is accomplished by so working on the fibres that enter into the designs, as that those fibres on the edges of the figures and colors shall overlap and sort of tone down the sharp edges or outlines of the printed design. This it is evident will give somewhat the appearance of a cloth, the design of which has been woven in, instead of printed, and will furnish one of the distinguishing features of this new class of colored effects.

In order to produce this altered position and lay of fibres several methods may be employed. It may be done by an energetic washing continued for a considerable time, in a washing machine that has good press and squeeze roller appliances. The same result may be accomplished perhaps more quickly and more successfully in the fulling mill with proper care exercised so as not to overtax the shrinkage factor if the fabric is a woolen. It may even be managed on the gig; or perhaps by the continued use of two of these processes in succession.

It is quite evident that whatever the method may be, the result is to bring about an effect which is very different from the ordinary results of printing already described. No sharply defined outlines will do here, and the intention is to have the printed cloth resemble as much as possible the woven effect. Indeed with certain modifications in the treatment, it is possible to imitate different weaves.

If we take a cloth of the common twill weave and print a design upon it of lines or streaks running parallel to the twill, the after process will make it look like a diagonal cloth. If the printing is so placed that the lines of the weave and of the design cross each other at right angles, then the after process will produce a sort of grained, or granite appearance.

Take this same weave and print with a design in checks upon it, and then put it through this process which alters the position of the fibres, and the result will be that all appearance of the twill will be removed, and the

fabric will resemble the plain canvas in its appearance and form.

This whole process has very pleasing effects and is used with marked success in the production of very beautiful and, at the same time, new and novel cloths. The idea has not been long in practice, but just at the present time the call for colors, and of variously and almost extravagantly colored fabrics, makes its discovery and application peculiarly timely.

MANUFACTURER.

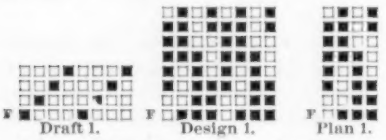
Woolen Manufactures.

IMITATIONS OF ALL-WOOL FABRICS.

We take this article from the Textile Manufacturer, because of its containing some practical suggestions to our own manufacturers in these days of competition, when there is a demand for low cost fabrics in good imitation of finer or all-wool fabrics.

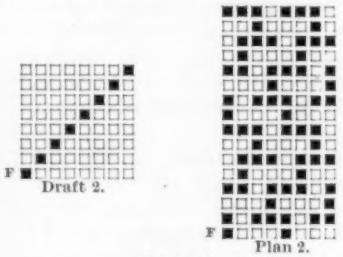
In design 1 are given particulars and details for a superfine heavy melton, made from fine Sydney wool.

Details:—"A:" Woolen warp, spun 28 yds. per dram, twisted to the left (open band) moderately. "B:" Woolen weft, spun 22 yds. per dram, twisted to the right (cross band) moderately soft. Warp "A:" 4160 threads on 4 healds, 82 in. wide. Reed: 13 dents per inch, 4 in a dent. Hair lists (or selvages), 48 ends each. Weft "B:" 80 picks per inch. Mill, dye, and finish to 58 in. wide. 32 oz. per yard.



Draft 1. Design 1. Plan 1.

It was found that the shorter the fibres, the fuller and closer the surface of the cloth became, and this fact led to the grinding up of the tailors' clippings from these fine goods, and their reemployment (under the name of mungo), mixed again with these fine wools, for the reproduction of the same goods. Most manufacturers were conscientious in those days—however little they may be so now,—and some resented the introduction of mungo, as adulteration and fraud. The fibres of the ground-up cloth (mungo) being shorter than the wool, added to and increased the fulness and closeness of the face of the cloth, a feature sought after and looked upon as a test of superiority. This soon left the conscientious and reluctant manufacturer behind in the race of competition, but when induced to make a few pieces with 25 per cent. of mungo, and then notice the choice of his customers, he found those with mungo preferred, although they cost less. Having thus swallowed a portion of his scruples in order to please his customers, he has gone on by degrees swallowing the rest, till he has none left, or at least no wool left to make goods with, and he has learnt to do without it altogether.



Draft 2. Plan 2.

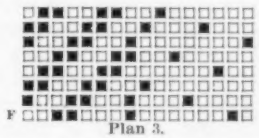
Design 2.

We are not disposed to go so far as he has gone, but in Design 2 is shown how he makes goods at one-fourth the cost of the genuine high-class article.

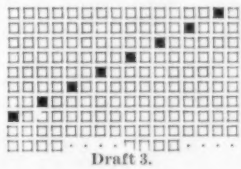
Design No. 2:—Cotton warp, melton; imitation of superfine. Details:—Warp "A:" 2/40's Egyptian cotton, 4160 ends, 80 in. wide in loom; rep selvages 40 ends each, on 8 healds. Reed: 4/13's. Weft "B:" blended and spun to 7 yds. per dram; weft 52 picks per inch. Mill, dye, and finish to 54 in. Finished weight, about 26 oz. per yard.

In imitating a high-class melton, costing 9s. per yard, he employs a cotton warp, and for weft a blend of new gray mungo, 50 per cent.; gray worsted rags, pulled, 30 per cent.; and fine Sydney wool, 20 per cent. The cloth will mill or full only in width, as the cotton warp will not shrink, consequently he sets his cloth about 80 in. wide in the loom, and fulls and finishes it to 54 in., which is a standard

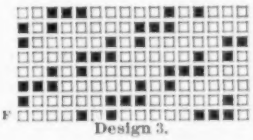
width for a slop clothier. The cost of dyeing and finishing these goods is about half the cost of the high-class in the West of England. Some very cheap, and at the same time durable and sightly goods, are made on these lines at 2s. 3d. per yard in the Leeds


Plan 3.

district, and find a ready sale, both in the home and export trades. In fact, these goods are a study for the keenest competitors.


Draft 3.

In No. 3 we give the design and details of a worsted trousering as made in the better qualities in the Huddersfield district, and in details "A" we indicate how this can be counterfeited after the Batley style of imitation. These imitations are really very good looking, but have only a veneering of worsted, and can easily deceive the uninitiated. They are not bad wear for all that, as the cotton is strong, and they are well worth their price. They are in good demand by slop clothiers and exporters at the present time.


Design 3.

Design No. 3:—Fancy striped worsted trousering, fine quality and spring weight. Warp backed. Details:—

Warp "A:" 2/40's black worsted.

Warp "B:" 2/40's lavender or pale blue worsted.

Weft "C:" 1/22's black worsted.

Warp: 4354 threads for the face.

Warp: 4354 threads for the back.

On 2 beams, 16 healds, cross drafted; 64 in. wide in loom. Reed: 8/17's. Weft: All black C = 64 picks per inch. Clear finish, 56 in. wide. Weight 21 oz. per yard.

Warping or dressing:

18 ends black A, for face.
2 „ lavender B, for face.
2 „ black A, for face.
2 „ lavender B, for face.

24 „ in pattern.

Dress the backing warp as face, and draw in the lavender threads "B" where marked (·) on the draft.

Details "A" for cheap trousering in imitation of the above; all cotton backing warp, and all cotton weft, but worsted face warp, as Design No. 3. The design, draft, and dressing are in exactly the same order as No. 3.

Face warp as No. 3, but only 4082 ends; 59 in. wide.

Backing warp 2/36's Egyptian cotton, 4082 ends; 59 in. wide.

Weft: 1/70's aniline black cotton, 72 picks.

No milling. Clear finish, 54 in.; weight 18 oz.

Dress the backing and face warps as No. 3, and draw in the lavender thread as marked (.).

In order to avoid speckled mixtures, lambs' wool has to be largely employed in carding woolens, especially for the bright colors, for which its short fibres lend themselves to greater distribution. In some mixtures, such as clerical grays or dark Oxford mixtures, even lamb's wool is then too long for a satisfactory result, when resort has to be had to fine and short flannel flocks. Five per cent. of these will distribute themselves much more minutely than the same quantity of lamb's wool, and produce a clerical gray superior to any other material for neatness and tone. The same remark applies to the lighter shade of clerical gray named Cambridge mixture, which is made with 10 per cent. of superfine white flocks and 90 per cent. black wool. These clerical grays are those quiet, unassuming shades usually worn by the clergy, and are formed

of pure black and white, which gives an ashen gray, deficient in brilliancy and tone.

The commercial world and ordinary people prefer brighter and more lively grays, which are obtained by employing a blue black in place of dead black, and a white previously tinted a faint blue. Indigo should be the color used for tinting, as it is one of the most permanent blues, and fades least under light and exposure. The same remark applies more strongly still to the lighter shades of gray. Assuming that aniline or any other fugitive blue had been employed, a few days in the sun or a visit to the seaside would soon expose the mistake and the wearer's coat become as cloudy as an English sky. Indigo being the most expensive blue, is often discarded in favor of cheaper dyes, and the manufacturer's reputation sacrificed to his greed. In these cases, the half worn garments are sometimes returned to him with a claim for damages.

Ireland has been found to be one of the most trying climates to colors, although it is not troubled with a tropcal sun. The cause lies in the strong saline atmosphere from the Atlantic, which is powerful enough to fade any but the fastest dyes. Common blacks and spurious blues fade like magic, and more delicate colors have a short and sorry looking existence. Indigo blues and woaded blacks of genuine dyes, and capable of standing the government tests and the service of the navy, are essential to the Irish climate and the best firms insist upon those guarantees. Whether in mixtures or in solid colors, the best dyes are the cheapest; the best firms never risk their reputation with the inferior ones, and in consequence are seldom short of trade.

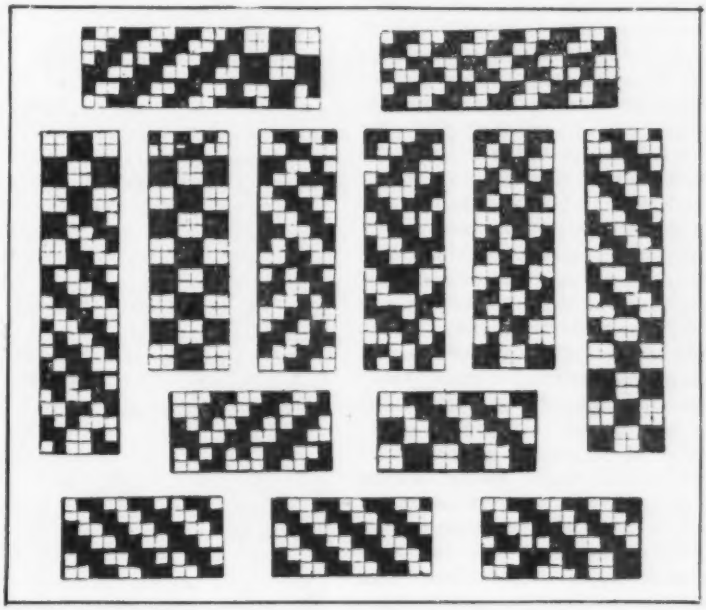
Either on the principle of the survival of the fittest, or from natural selection, different branches of the trade in manufactured wools have located themselves in different districts. Why they should have done so does not appear at the first glance, but something favorable to their development has evidently exerted its influence. Whether it be climate, water, the disposition of the people, or the price of labor, the distribution has occurred, and each district is now noted as the home of some special branch of the woolen industry. With this distribution, different systems and methods of treating the wool and material in process have sprung up—each one being the outcome of experience and practice—as the most fitting and successful method of producing the respective goods. This shows that in practice the rigid lines of theory have had to give way, and that one process will not suit all branches of the woolen trade.

Perhaps it would be difficult to find another class of manufactures which requires so much elasticity, and lends itself so little to theory as this trade. Hard-and-fast lines in manipulation do not fit a staple article which never shows two crops alike, nor exhibits fibres of equal length. The mixed lengths of fibres, and the mixed blends containing staples of varying length, from ¼ to 3 in. (two blends seldom being exactly alike), require accommodating in practice by a system of give-and-take, which no theory has yet been made to fit.

This accommodating or humoring of mixed blends in the carding process can only be learnt in actual practice. It has often been called "rule of thumb," a statement very unfair to expert foremen, since the best authorities could never yet reduce the carding of wools to hard-and-fast lines. Ordinary clean wool will make its own weight in yarn under good workmanship, whilst mixed blends will waste in different degrees, according to their quality, the lowest class often wasting 25 per cent. between material and yarn. This amount of waste is often unavoidable, but its extent is largely dependent upon the skill and ability of the foreman carder. Some foreman make a minimum of waste, while others seem to be unable to prevent an excess, a feature which often represents the success or ruin of the manufacturer.

A Puzzle Design.

The Textile Magazine which is published under the auspices of the Yorkshire College, Leeds, Eng., recently gave the accompanying parts of a design with a suggestion to its readers that they cut the pieces out and paste them on cardboard in their correct order and send their solutions to the editor of the magazine in the form of a perfect design which, if correctly rearranged, form a simple weaving design on 36 threads and 36 picks.



We present the same to our reader, suggesting that they reproduce these designs on point paper and then cut them out and re-arrange them into a design of 36 threads and 36 picks. We should like to see the results.

—It is a well-known fact that chlorine has the effect of preventing wool from felting. It would, therefore, presumably prevent wool fabrics from shrinking, for it is the felting property of wool that brings about the shrinkage during washing operations. A solution of 3-lb. bleaching powder for each 100-lb. weight of wool is made and the goods rapidly immersed in this bath, after remaining in about ten to fifteen minutes they are taken out, put into a bath of hydrochloric acid of 2 deg. Tw. for ten minutes, then thoroughly washed. It is not advisable to use more than 3 lb. of bleaching powder, or otherwise the goods will be yellowish in color and have a harsh feel.

—It is unreasonable to assert, as is often done, that a certain coloring must sell simply because it was a good thing many years ago. The taste of the general public is most decidedly artistic, and to meet this taste we must be ready and able to place goods on the market which, whilst inexpensive, may still be pleasing in the arrangement of colors and design, and well finished.

—In comparing the various classes of goods placed upon the market, it is common to notice that although the English article is admitted to be generally of a strong and useful quality, yet in the character of the finish and general style the home-made article is often inferior to the Continental.

KNITTING DEPARTMENT.

Knit Goods Situation.

About everything that was said of knit goods a month ago can now be repeated with increased emphasis.

Seasonable weather, although rather too late to be of much use, has prevailed, American arms have been thrice triumphant, (twice within less than two weeks) and the outlook for peace improves daily. Wage earners have not been so largely employed for years. Farmers are receiving fair prices for their products, and only the narrow margin of profits as a result of intense competition, stand in the way of a satisfactory business.

Foreign advices are uniformly strong. In hosiery, blue shades, particularly in fine imported goods, are in rapidly increasing demand. Blacks do not seem to show any decrease in consequence, however. Tans and miscellaneous shades will probably be the ones to suffer.

Plans of importers generally are based on a large spring season. Manufacturers on the other side apparently do not fear any shrinkage in the call for fancies. They are showing more fancy sample lines than ever. In these, stripes predominate, where straight stripes do not prevail some modification of stripe is used. The stronger lines of fancies are sold way ahead. Part of this crowd is sure to bring up a sorry finish. Lisle goods with drop stitches and ribs of varying design are well taken care of.

The hosiery mills that are idle are, with a very few exceptions, those that have staked everything on low priced stuff, better called "trash." They are now simply reaping their reward. There probably never was a year when seasons so overlapped as the present. Not a few mills of all sorts are working on spring, summer and fall goods at the same time. Of course this is better than to be idle, but the crowding of different weights together with a previous dull spell is only half satisfactory to all concerned. Some manufacturers have run out goods within the last two months, in response to orders for immediate distribution that they were ashamed to put their trade marks on.

The recent arrivals of retail buyers in New York indicates that they expect the fall season to open early. Golf hosiery is in better shape. A lot of cheap goods in this line were thrown upon the market and having some merit, quickly caught the crowd. The only remedy was adopted, the knife was put into the old goods, which are now convalescent. Duplicate fall orders, much larger than usual are expected.

The underwear houses started preparations more than two weeks ago for the fall trade, with a few exceptions. More pains are shown in selecting for quality. In no direction is the tendency toward better grades more noticeable than in the growth of the fine foreign underwear trade. All the best balbriggans are oversold.

The wool market lends additional strength to the situation. Several of the weakest producers have quit within the last six weeks, leaving a clearer field. It is a long time since the prospect has been more encouraging.

—The International Cotton Mill, Shanghai, is now working to its full capacity and turning out 100 bales (of 400 lb. each) of yarn a day in the working-day of 21 hours, which is the output guaranteed by the makers of the machinery.

—Coloring is the most important part of designing nowadays, and is absolutely essential to a successful designer.

Technicalities of Power Knitting.

J. H. QUILTER.

(Continued from July,)

Working with the face of the frame, are the jack sinkers during their motions after first forming the loops. The movement to these is regulated by a locking cam. This is shown at Fig. 11. "B" is a sketch of this cam on the shaft "A" fixed as before by boss "C." This controls the lever "K" by acting on the truck "H" attached to same. This lever works on a fulcrum at "F," and beyond this is the upright lever or rod wheel which extends into the frame and is suitably

J. H. QUILTER.

connected to the locking bar, working over the tails of the jacks to give them these various positions.

These are chiefly: First, as they stand at the commencement of a course, level with the lead sinkers. They then fall individually, by action of the drawing cam, to their lowest position. This may be termed their second position. Now they are locked to their highest or third position; falling from this to their first position. At this time, the cam is as shown at "I" in Fig. 11. From there to 2 is the draw, but almost before this is completed the locking bar commences to descend to get to the jacks, and commences gradually to lift them, to liberate the thread from the jack sinkers to the lead sinkers as they descend.

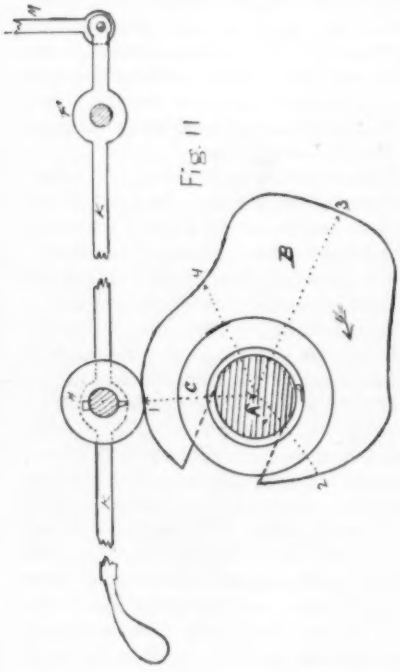
Now, when the cam arrives at 3, the jacks are raised to their third or highest position, falling again to first position, ready for the next course. By following the sketch of a locking cam, it will be seen how such movements of the jack sinkers can be got, and these must be in perfect time with the lead sinkers, the movement of which are controlled by the sinking cam. These two cams then control all the up and down movements of the face of the frame, and it is only regarding these movements that these cams require examination.

Here is the true advantage of a combined practical and technical education, as by the latter the particular work of each cam, lever, rod, and even the minutest details, are studied and their necessity traced to the actual loop forming, where all the movements, as explained, are required to follow each other smoothly and in perfect time, one with the other. This being known any wrong movement can be traced at once, as, for instance, if, in dividing, the loops are not perfectly even, only two things can be the cause, either the lead sinkers do not fall low enough or the jack sinkers do not rise high enough. Now adjust these until all jacks rise to the verge and this being true, all loops should be perfect. On this point all other movements being equally correct only good work can result.

With such a knowledge, adjustments to counterbalance wear and tear can be made with much greater accuracy, both to the advantage of the fabric and machine.

Our next illustration, Fig. 12, shows the presser cam. This has only one action, viz., that of bringing down the presser, but this must be most accurately for, as it will be seen later, this practically comes during another motion. This cam is also shown in its inoperative position before the thread

is laid and other cams are at work, while this travels from point 1 to point 2, where the cam is in action. It will be noticed that the cam begins to give action to the lever "K" some time before it reaches its actual working point. Thus lever "K" by being attached at "F," as a fulcrum, begins to descend, bringing down lever "M," which is attached to the presser bar connections, so that it gradually descends and at the time the new loop passes under the needle beard, the



presser is down to the needle ready to immediately close it, so that the old loop which follows close behind shall pass on to the top of the beard.

The pressing motion is practically an instantaneous one, and must, as before stated, be most exact to time, and so adjusted as not to give too great stress upon the needles; nor on the other hand trust it be insufficient to firmly close the beard of the needle into the eye, or the old loop will not pass freely on to the needle, and so cause an imperfection.

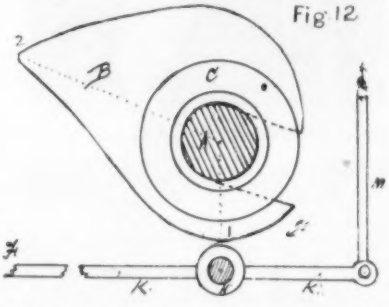
From Chemnitz.

[*From our Special Correspondent.*]

Chemnitz has long been looked upon as one of the world's important textile centres. Of the 2500 concerns that are in the Chemnitz district, 987 turn out textiles. Many of the machine shops do a very large business in building looms, mules and other textile machinery. In one year 1896-97 there was a decrease in the textile branch of 54 concerns. This indicates a backward movement caused by a curious combination of events, the most noteworthy of which is the now famous bill of one Mr. Dingley.

The goods that the textile machines of this city are turning off go out into all parts of the world. It is a remarkable economic phenomenon, found, perhaps in no other part of the world, that almost, if not quite all, the business done by Saxony in selling to the outside world, is done direct. No Hamburg, Bremen or Berlin houses hold rods or lashes over manufacturers and merchants here. Buyers from abroad haunt the hotels of this city at all times of the year. Agents of Chemnitz houses are in Russia, Asia, Africa, Australia, the two Americas, showing samples of Saxon goods.

Time was when Nottingham and Troyes were the equals, if not supe-



riors, in amounts exported to the States. Even now, after all its efforts, energies and enterprise, Chemnitz can hardly claim a class of goods equal to Troyes' or Notingham's best. It is not in "best," but in good goods at fair prices that Chemnitz, and not only Chemnitz but all Saxony, and the Em-

pire succeeds. Fifty years ago the fortunes of the city's richest were laid. Knitting machines were bought in England, put up here and run by "help" brought over from England or by knitters who had been sent to Nottingham and Leicester. Fifty years is not a long time, at least not long in the life of a people, and yet in those fifty years a whole trade has been revolutionized; yes, in twenty-five years. Formerly Americans, buying knit goods in foreign parts, spent most of their time in English or French cities; few came to Chemnitz. Now all come here practically passing by the English and French cities. Once it was weeks in Nottingham and Paris (Troyes) to days here; now it is weeks here and days in Troyes and the English cities. The "cheap and nasty" of 1876 has been turned into cheap and good. "Made in Germany" did more for this people than any other one thing except technical schools, in 50 years.

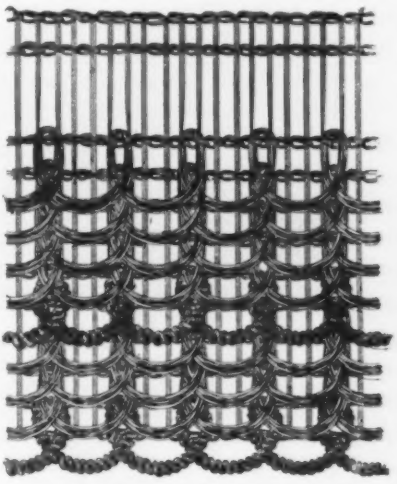
Whether all this is to go on is a question. A change is appearing. There is a noticeable decline in the production of hosiery and gloves and underwear. The United States are Saxony's best customer, but they buy, by no means, such large quantities as formerly. Year by year marks a falling off. The United States are manufacturing for themselves. In plain goods, Ft. Wayne, Philadelphia and Providence are leading the world. Lots of your domestic knit goods, especially ladies' hose, half hose and underwear will more than hold their own with any made here.

It may take a long time to turn out as fine textiles as Saxony; whether you do or not must depend on yourselves. What others have done and do, you should not despair of doing. There is not so much in hereditary as is often argued. It may give aptitude, but this may be acquired. To Saxony, the German Empire owes more of its industrial art and development to technical schools than to hereditary or to any other half dozen factors. To make real fine goods requires patience, skill and good materials. Germany has patience and acquired skill, and she goes into all parts of the earth for materials. If her climate or help will not let her spin yarns as fine as those of England she will buy in Manchester. Nothing daunts her, what nature hath denied she gets by artificial means. For moisture, natural to the British islands, she substitutes steam or a very fine spray of water.

Design for Trimming.

We illustrate, herewith, a design for trimming, recently invented.

The design consists of a series of parallel-spaced strands, interwoven with crossing strands and forming the



body of the fabric, with festoons overhanging or appearing in front of the strands and interlooped at the beginning of the festoons with crossing strands, adjacent festoons crossing each other. Some of the festoons appear in plain strands, while others appear in the form of a strand wound spirally on a core. The leading feature of the design consists of festoons appearing on the face of the body of the fabric.

—The mountain wool of Ireland is the coarsest, whilst the downs or lowlands supply the finer qualities.

Highlandville.

The village of Highlandville is situated about eleven miles from Boston, in the town of Needham, and occupies a unique position in the knitting manufacturing industry of the State, in the variety of goods that are made on the knitting machine, as a home industry, which apparently has been conducted successfully from the time it was first introduced in that place, as evidenced in the pleasant homes and well kept grounds of those engaged in this occupation. There is a general thriftiness about the village, showing prosperity and contentment. The knitting industry in this place was established about fifty years ago, by a number of English knitters who set up hand frames in their houses, and plied their vocation until long after the war, or till 1875-80, when power machines were largely substituted for those worked by hand. By 1885, no hand machines were in existence, of any consequence, employed in the strictly manufacturing establishments. What now remains of the hand machines are those operated as a home employment, as relics of the old method of manual labor. There are eighteen persons and firms in Highlandville pursuing the special occupation of knitting. Four of these are manufacturing establishments, the remaining ones being strictly house industries. There are in the New England States, as near as we can ascertain, thirty concerns that do a knitting businses on hand machines, divided among the several States, as follows: One in Maine; one in New Hampshire; one in Rhode Island; one in Connecticut; and 26 in Massachusetts, 14 of which are in Highlandville, four in Boston, and 8 in various other parts of the State.

The character of the products manufactured at Highlandville is as follows: men's and boys' gloves; golf stockings in Scotch heather mixtures, fancy plaids, etc.; surgical elastic stockings; ladies' and infants' mittens and gloves; ladies' skirts; athletic goods of various descriptions, including sweaters, in plain, Shaker, turtle, and royal rib; theatrical goods in all colors, and other like fabrics. Outside of the city of Boston, where there are twelve small competing concerns, there are none in the State that compete with the products of Highlandville, except at the following places, where there is one concern each: Chicopee, Dedham, Everett, Farley, Hyde Park, Long Meadow, Malden, Needham, Newton, Newton Lower Falls, Pittsfield, Stoughton, and Waltham. In the town of Needham, all of the knitting establishments are private concerns, except one recently incorporated—the John F. Brooks Co., Highlandville.

WM. CARTER & SON'S FACTORY.

Knitting is the only textile occupation in this town. The oldest existing establishment was organized in 1860, but most of them are those that were organized between 1880 and 1889. There are only four factories, properly speaking, in Highlandville, the oldest one is that of William Carter & Son.

Wm. Carter & Son's business was established in 1860, and is now confined chiefly to the manufacture of shirts, drawers, mittens and hosiery, though the mill is equipped to do fancy knitting in general. The firm's product is of a very high grade. Its shirts and drawers are made of wool and cotton, wool and silk, silk and worsted, all silk, and cotton, the latter being American Peeler and Egyptian, all combed, for 24 to 40 guage goods. The mittens are made as fine as 30 gauge. All of the goods made by this concern are attractive in workmanship and in design. A number of English knitting machines are in operation, as the Cotton's patent fancy rib machine, etc.; also, some German machines. American machinery made by Charles Cooper, and by Campbell & Clute, are also to be found there.

Moseley & Company's mill is located immediately opposite to that of Wm. Carter & Son, and was established in 1880, and is largely engaged, at present, in the manufacture of ladies' and children's ribbed underwear, of wool and mixtures; also, infants' ribbed hose and socks of worsted; ladies' fashioned and infants' ribbed wool mittens; ladies' corset covers of fine cotton yarn, etc. The ribbed underwear for ladies is of a grade that weighs 6 to 9 pounds per dozen, while that for children is made only on fine gauges. Circular and flat machines of American make, and some English rotaries, are to be found in this mill. The American flat machines are made by the Pepper Mfg. Co., Lakeport, N. H., and the circulars by Scott & Williams and Lewis Jones, of Philadelphia.

In the more northern part of the village is located the John F. Brooks Company, recently incorporated, engaged in the manufacture of infants' shirts and bands of merino, all wool, silk, and silk and wool, 24 to 40 gauge. This mill has 26 flat frames made by the Pepper Mfg. Co., and four circular frames made by the latter concern, and by Nye & Tredick, Philadelphia. There are 25 finishing machines in operation, made by the Merrow Machine Co., Hartford, Conn., and others.

In the eastern part of the village is the factory of J. B. Thorpe, engaged in the manufacture of infants' shirts, of merino, all wool, silk, and silk and wool, from 30 to 40 gauge fine; also, ladies' mittens, all worsted and all silk. Flat machines, made by the Pepper Mfg. Co., are principally employed with a few circulars. Mr. Thorpe represents that his business is good and all his machines well employed. He sells only to the jobbing trade.

In the western part of the village is the well known factory of Roper Bros. & Co., the oldest and largest manufacturers of athletic goods in New England, made on circular and flat frames. This concern was established about 16 years ago.

The only mills that are equipped for dyeing are Wm. Carter & Son, and Roper Bros. Company. All of the mills buy the yarn that they use.

One of the most interesting establishments to visit, is the shop of William Gorse & Co., who operate five hand flat frames, on surgical elastic goods. Mr. Gorse was the first one to make surgical elastic bandages east of Philadelphia. He has been in the business 25 years in Highlandville. His product is largely in demand, especially at this time for army purposes.

Those conducting a house industry in knitting are as follows: George Armstrong, Beless & Bowmar, Wm. Gorse & Co., Mrs. Anne Hall, Amos Hammersley, Samuel Hudson, George L. Kennedy, A. J. Jones, L. Langdale, Fred Latham, James H. Patrick, Henry Smith and George Spicer. These house industries are carried on either in a room or in the basement of the house, or in a small shop adjoining thereto. Some of the finest ringwood gloves of worsted, and men's gloves of wool, are made in these places.

—The German Empire neglects nothing that aids her foreign commerce. Her interest in home industries is equalled by her efforts for trade in far-off lands.

Improvement in Knitting.

We give in connection with this article, an illustration of a knitted fabric made upon an improved knitting machine, invented by R. W. Scott, of Scott & Williams, Philadelphia. The improvements and mechanical devices are for the production of a shaped or fashioned knitted web in which the

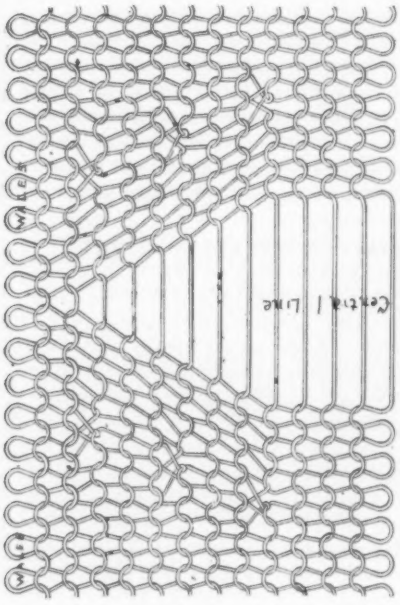


FIG. 1.

widening-wales are introduced without the necessity of transferring stitches from needle to needle and without the formation of eyelet-holes or gaps in the knitted web at the points where the widening-wales are begun.

Figure 1 is an exaggerated diagram of a knitted web capable of being produced on the machine, and Fig. 2 is a modified form of the web.

In Fig. 1 there are shown thirteen successive courses of a web into which six widening-wales have been introduced, three on each side of the central line. Thus it will be seen that in the first, second, third, and fourth courses of the web each side of the latter is composed of six wales, an additional wale being introduced in the fifth course, a second additional wale being introduced in the eighth course, and a third additional wale being introduced in the eleventh course. The opposite portions of the web in the first, second, third, and fourth courses are separated by floating threads and the length of these floating threads is gradually diminished as the opposite portions of the web are widened by the introduction of the additional wales until finally the two portions of the web join and form a continuous fabric. The opposite portions of the narrow web and of the web in which the widening has been effected can then be united by joining the wales of the opposite webs by means of an ordinary looping machine, or by sewing, or in any other available manner, the floating threads "a" being then removed.

The method of introducing and

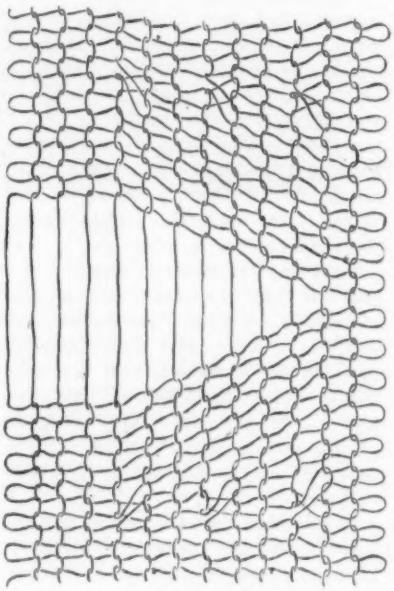


FIG. 2.

crossing the widening-wales can be employed in a web in which the bordering-band is not of uniform width, or, in other words, in which the widening-wales are not always introduced at the same distance from the edge of the web in the widened

portions. A web of this character is shown in Fig. 2.

Although the invention is applied to a circular-knitting machine having a rotating thread-guide it will be evident that it may be applied to circular machines in which the thread guide has a back-and-forth motion, so as to form selvages on the end needles of the set of needles carried by the cylinder, or it may be applied to straight machines having reciprocating thread-guides.

Bleaching Knit Goods.

In compiling the information on this subject, published in the course of the last twelve months one is struck by the fact that less and less time is spent ou evolving cheaper bleaching methods than heretofore. On the contrary, bleachers very decidedly advocate and search for a more satisfactory treatment than that with chloride of lime or sulphur. It seems as though catering to the cheap ideas of department stores has been a trifle overdone, and that the public is clamoring for goods which will look as well when sold, but also wear far longer and retain their color.

The public is certainly right in this respect as far as wool or mixed knitgoods are concerned. We know of a number of large woolen mills who still retain the sulphur bleach for their yarn and goods, putting out wares which, at their best, will show a white until they are in the hands of the consumer, when they will rapidly turn yellowish, if dyed, fade or change color. However, those goods are not hurt in body by the sulphur treatment, though they are unsatisfactory and deceiving as to color. But even manufacturers of mixed goods still largely adhere to the old destructive methods of bleaching, though they know full well from their own practical experience, with old stock prehaps, that if bleached with sulphur the fibre of vegetable origin will have been rotted more or less. If whitened with bleaching powder the ainmal fibre will have been partially decomposed by the chlorine. The sale of such articles, in the light of recent progress, is little short of criminal, and is as sure to work its own punishment, as though the act did really conflict with the penal code. Ignorance can hardly be pleaded, unless freedom from censure be claimed under the "Baby act"—for the literature of past years has been replete with suggestions, formulæ, descriptions of foreign methods and recipes, etc.

The latest formula we have come across was published by a German textile journal, and as it has been tried on an extensive scale in this country also, and been found absolutely satisfactory, it may bear repeating. The process is given for both all-wool and mixed goods with but slight modification, and is as follows:

Great stress is laid on a thorough preliminary cleaning for which, if necessary, even caustic potash may be used with discretion. At all events, none but potash soap should be employed. The bleach bath is made up for 100 lbs. of goods by mixing ½ lb. sulphuric acid, 66° Be. into the necessary water, dissolving separately in hot water 2¾ lbs. oxalic acid, and add to bath, then stir in 2 lbs. peroxide of sodium, and lastly make alkaline with 2 lbs. silicate of soda. Enter goods, warm to 110° F., bleach 2 to 6 hours, wash thoroughly, give 5 minutes in a sour bath of 100 gallons water and 8 lbs. oxalic acid, wash again and dry. The silicate of soda may be replaced with 5 lbs. Marseilles soap. The bleach bath is restored for the next batch by the addition of ½ the above chemicals with the exception of the silicate and soap.

Nothing has yet been found to equal the peroxides for bleaching qualities, and peroxide of sodium is recommended only because it is the cheapest and most convenient variety. They act by oxidizing the coloring matter, it being presumed that the color is thereby rendered soluble and is subsequently washed out. The peroxides cannot injure the fibre, neither animal or vegetable, and are, therefore, really the ideal bleach for mixed goods, there being absolutely no drawbacks in their use, not even with reference to cost. —G. W. K.

POWER DEPARTMENT

ELECTRICITY—STEAM—WATER.

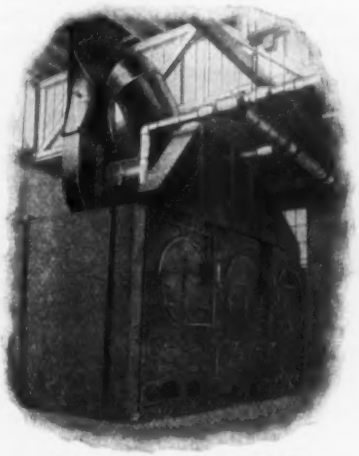
A Chimney that had Outlived its Usefulness.

When the tracks of the N. Y., N. H. & H. R. R. were recently elevated at Jamaica Plain, Mass., it became necessary to remove a number of the adjacent buildings of the B. F. Sturtevant Co., and to change the location of the existing boiler plant. The chimney, which had previously served as a means of producing draft, was thus rendered absolutely useless because of its distance from the new location of the boilers. It therefore became a question whether another chimney should be erected or a fan employed to produce the draft. Naturally the latter method was adopted, for the B. F. Sturtevant Co. are large manufacturers of fans and are installing large numbers for the purpose of mechanical draft. Accordingly, a specially designed fan was placed on top of the boilers, connection was made to the uptake, and a short stack was provided extending just through the roof. The general arrangement of the apparatus is shown in the accompanying illustration. The fan is equipped with a direct connected upright engine, the speed of which is so regulated by an automatic device that the draft is materially increased when the steam pressure falls slightly. The result is practically constant steam pressure. The arrangement has required no attention, fulfils the requirements, makes possible the burning of cheaper fuel, and has a marked influence in the prevention of smoke.

A MANUFACTURING ESTABLISHMENT WITHOUT A CHIMNEY.

The deterioration of the unused chimney and the utilization of its bricks in the erection of a new building has led to the recent removal of the old means of draft production, and

the passerby is now favored with the unusual spectacle of a large manufacturing establishment without a chimney, or at least anything that appears to be comprehended by the ordinary definition of such a structure. The accompanying view represents the works as they now appear, the present steel plate stack from the fan being visible on the right about half way down the length of the buildings. That such means should serve as an efficient substitute for the chimney is not evident until one considers the peculiar adaptability of the fan for such a purpose. Inasmuch as it is usually built of steel



DRAFT FAN OVER BOILERS.

plate its construction may be such as to most perfectly fulfil the requirements, for it may be used either for forcing the air to the ashpits or exhausting it from the uptake; it may be placed above the boilers or in any location where the space is not valuable; its capacity may be varied at will; great intensity of draft may be maintained without reference to the conditions of the weather, which so often affect the working of a chimney; the draft may be maintained while the waste heat in the gases is utilized by the economizers, and above all it can be installed for far less first cost than a chimney.

The rapidity with which this method of draft production is being adopted certainly warrants the assertion that the time is at hand when such evidence of its use as is indicated by the absence of a chimney will be found on every hand.

Practical Electricity.

TROUBLES.

(Continued from July.)

In continuation of the last paper and taking up the second head as outlined therein, there is a trouble to which all dynamos and motors are very liable, viz. the heating of the various parts.

While excessive heating in electrical machinery is positive indication of trouble; it does not necessarily follow that all the parts which indicate a rise in temperature are at fault; for instance, a hot bearing may cause the commutator or armature throughout its entire length to become unduly heated and vice versa.

It is well, when troubles of this nature are discovered and when there is any possibility of doubt as to the origin of the heat to stop the machine and allow it to cool.

Upon starting again and running a few minutes the trouble will be located in that portion of the machine which heats up first.

The question which most often presents itself to the attendent is how hot can the various parts of a dynamo or motor become and yet be within the safe limit. The degree of heat can be determined by applying the hand to the various parts. If the heat is bearable it is entirely harmless, but if the heat becomes unbearable to the hand for more than a few seconds, the safety limit has been reached and the machine should be stopped and the fault located.

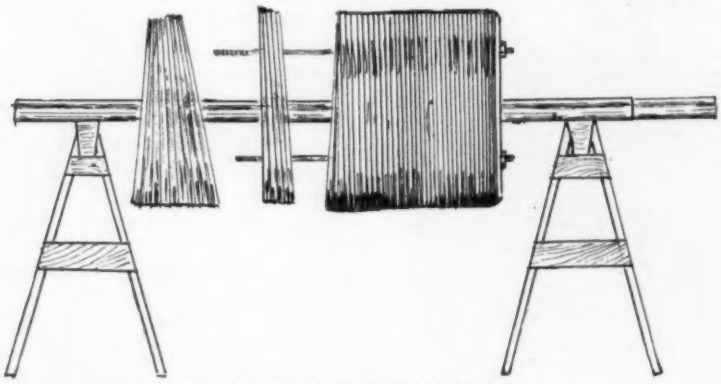
Of course when solder begins to melt at the commutator connections, and shellac begins to "try out" of the armature and an odor of burnt cotton begins to pervade the air, the safe limit has been far exceeded. In point of fact it usually happens that serious damage has already been done.

To be more definite no part of dyna-

mo or motor should be allowed to rise in temperature more than 80° F. above the temperature of the surrounding air, excepting in the case of commutators where no solder has been used to connect the leads. These can be allowed to rise to a still higher temperature.

In taking the temperature of a hot part, it is convenient to use a thermometer in which the scale of degrees has been etched on the stem. Bind this to the heated part having first taken the precaution to cover the bulb with waste to prevent the radiation of heat and take the reading when the column of mercury has ceased to rise.

First in order then in a discussion of the heating of the various parts



METHOD OF ASSEMBLING CORE DISK.

are the bearings. This trouble is due to causes which may be classified as follows:

1. Lack of oil.
2. Bearings worn or shaft cut and rough.
3. Shaft sprung (An armature in this condition will turn more easily at certain parts of a revolution and will appear when running much out of balance.).
4. Grit or dirt in the bearings and oil supply.
5. Bearing fits too tight to shaft.
6. Bearings out of line.
7. Belt too tight.
8. Bearings heated by a commutator or armature which is over heated.

If the bearing has become too hot it will not do to stop the machine as it may cause the sleeve to stick fast. In this case the armature must be kept turning slowly and fresh oil poured in until the bearing has cooled down somewhat.

Very frequently it happens that an armature loses its end motion or "play." This swinging motion of the armature causes the bearings to wear evenly, distributes the oil from end to end and prevents heating. Allowance is made in the design of most machines for this "play" but in practice it can only be obtained when the machine is in proper allignment and the belt not too tight.

Heating of the commutator and brushes. A hot commutator is often due to the heat produced in the armature, field or bearings. The remedy is obviously to remove the source of heat.

Sparking perhaps more than any other cause is responsible for hot commutators. The remedy for this difficulty has been treated under the head of sparking at commutator as developed in a preceeding paper.

Carbon brushes while they possess many advantages over the copper brush, in that they do not cut the commutator, are less liable to spark and in general require less attention, still their comparative high resistance causes them to heat up more than copper; particularly is this the case where the brushes make poor contact or where limited commutator surface would indicate that it had been de-

signed for copper brushes. There not being room for carbon brushes of sufficient size to carry current.

The remedy in the first case is to make good the contact of the brush with the commutator and in the latter case to substitute brushes of lower resistance.

Brushes screwed down too tight causing friction between brush and commutator is a frequent source of heat.

It is necessary at times, where the commutator is rough or eccentric to screw the brushes down hard in order to make contact at all. This will cause more or less heat and can be

METHOD OF TAKING TEMPERATUREOF FULL COIL.

remedied only by turning off the commutator and adjusting the brushes so as to make light but firm contact.

Over-heated commutators may disintegrate carbon brushes and cause them to become coated with a black film which offers a high resistance and aggrevates the heating. In such cases keep the commutator clean by wiping it off occasionally with a soft cloth moistened with a little vaseline or oil.

Bad connection in the brush-holder due in most cases to dirty brushes making poor electrical connection with brush-holders is a constant source of heat which will be transmitted to commutator.

Short circuits between the segments of the armature, the current leaping through the mica which separates them will cause more or less heat in the commutator. This trouble is one which at times is difficult to locate, from the fact that there may be no external indication of it. It will, however, be apparent upon making a bridge test, or the more convenient test known as the drop of potential method.

It is not the purpose of this article to go to any extent into the details of the testing of dynamos or motors as this subject will form the basis of a future paper. But with regard to the last mentioned test it may be said that it is a method of measuring consecutively the drop of potential along each coil in the armature.

A strong curent from some constant source, such as a secondary battery is sent through an armature coil, by placing the terminals of the battery on adjacent commutator segments, the drop of potential is then measured by means of a milli volt meter or delicate galvanometer. Any short circuit whole or in part, either in coil or between commutator segments, or any open circuit or poor connection will at once be indicated by an appreciable difference in drop along that coil.

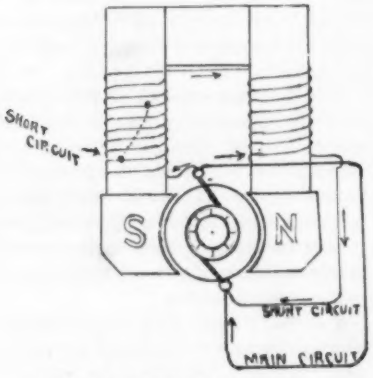
A commutator having a short circuit unless indeed it is on the surface where it can be readily removed should be disconnected from the rest of the armature, the shell loosened up and fresh mica inserted.

Excessive heat in an armature will very often char the insulation of one or more coils of wire causing them to burn out entirely. Such coils must be taken out and rewound in order to save any part of the armature. In most armatures of the so-called Gramme type this can easily be done, but in the Drum type of armature it will usually necessitate an entire rewinding.

If a motor, or a dynamo run as a motor is run without load, any excess of curent is at once evident at the ammeter in circuit. As this current is not all required for twisting torque but only a small constant portion of

it. the excess must be converted into heat through some defect. Such a test is therefore the best indication of the condition of the armature.

The most common indication of heat in an armature is the heated current of air which an armature throws off.



SHORT CIRCUIT IN FIELD COIL.

The causes of this heat then may be classified as follows:

First, excessive current in armature due to overload.

Second, short circuit in armature coils.

Both of these troubles will cause sparking as well as heating and their remedy has already been described under the head of "sparking at the commutator."

Third, moisture in armature causing partial short circuits. Remedy is the most natural one; bake in an oven and keep dry in future if possible.

Fourth, heat transmitted from other parts as already spoken of.

Fifth, foucault currents in the armature core. In this case the armature body either has not been properly laminated as it is called, or the insulating material between the stampings has charred out after long continuous run. A condition such as this will permit Foucault or Eddy currents to be has charred out after long continuous nally with the axis of the body and cause its entire heating. A fault such as this entails the stripping the armature, and reinsulating the stampings. This is sometimes accomplished by inserting strips of tissue paper between remedied by baking in an oven till all good japan is sufficient.

Sixth, Eddy curents may be found in the armature conductors themselves provided they are large. This is a matter of first construction. Our cut shows how lamination is sometimes carried on in large conductors.

Heating of the field magnets is a common fault and means primarily too much current flowing through the field coils. In the case of the dynamo it may mean that the voltage is too high. The remedy is to reduce the voltage or increase the resistance of the shunt field. Field coils are susceptible to short circuits as shown in the cut. Should the fault occur in one field, that one will be the cooler of the two, with corresponding weakening of its magnetism. This trouble more often than any other results from allowing the fields to become soaked with the oil from the bearings. Oil seems to have a tendency to rot the

METHOD OF LAMINATING CONDUCTOR.

insulation on the wires and thus forms a ready short cut to the current. A fault such as this can only be remedied by rewinding the coil or coils affected. Partial short circuits in the field is sometimes due to moisture and can be remedied by baking in an oven till at moisture is driven out.

As with the case of the armature body, so with the field core, Foucault currents are generated though as a usual thing not as intense. This is of course a structural defect and an attempt has been made to remedy it in machines with laminated feed cores.

Lighting Factories and Shops.

In the designing and building of modern manufacturing plants one of the most important questions to be considered is the lighting of the interior of the building. Manufacturing plants at the present time are located, generally speaking, in large cities, or at least in regions where the population is somewhat dense, so that a great deal of loss is experienced by the owners on account of the help watching people passing by or by occurrences taking place in the adjoining streets. On the other hand the importance of thoroughly lighting the interior of a shop is so great that often this fact takes precedence over all others. Why not combine the two? Why not have a well lighted interior and at the same time have the sides of the building so constructed that employees are unable to have their attention attracted by what is taking place in the surrounding streets?

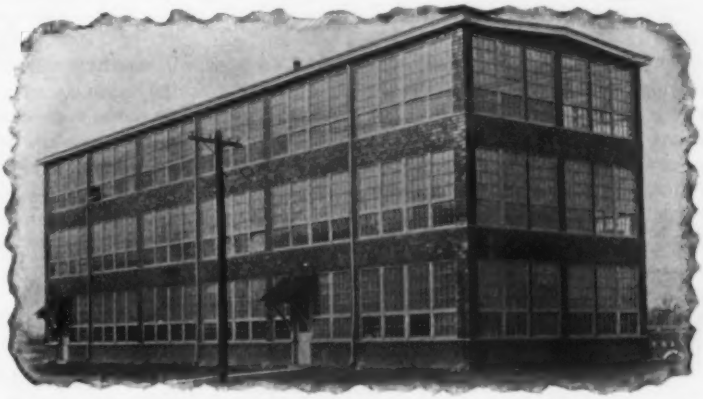


FIG. 1.

We illustrate herewith, a machine shop designed and built by the Berlin Iron Bridge Company, of East Berlin, Conn., for the Veeder Mfg. Co., of Hartford, Conn. The Veeder Mfg. Co. are noted for the excellence of the Veeder cyclometers which is one of the best, if not the best, instrument for recording distances traversed by bicycles there is made in the country. The mechanism of these cyclometers is very fine, and in the different pro-

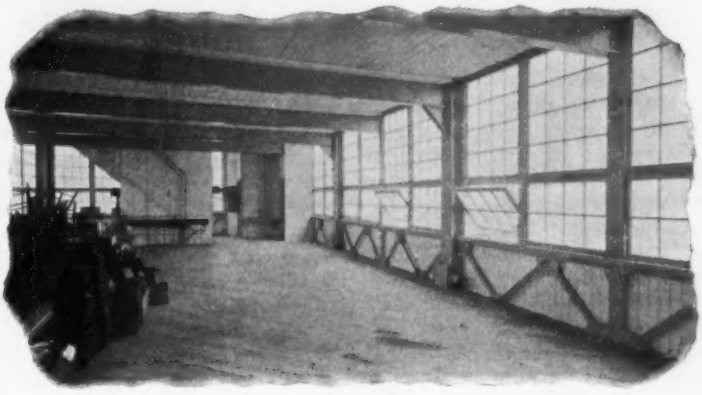


FIG. 2.

cesses of manufacture it requires the best of light in carrying on the various operations. The business of the Veeder Mfg. Co., being largely on the increase they decided to build an entire new plant, and the illustrations, herewith, show their new machine shop, both externally and internally.

The first illustration shows the exterior of the building, which is of a somewhat novel construction. The supporting framework is entirely of steel, the greater portion of the construction being steel and glass. It is three stories in height, the exterior presenting a very ornamental appearance from the unique character of the construction. It is 30 ft. in width, 110 ft. in length, the three floors giving nearly 10,000 square feet of floor surface, every inch of which, owing to the well diffused light in the interior of the building, can be occupied for manufacturing purposes.

Fig. 2 shows the interior of this building, the photograph from which this illustration was made being taken in the second floor showing the supporting girders of the third floor above, and the truss work forming the supporting girders for the sides of the building. The interior is heated by hot air forced into the interior of the building from an adjoining boiler room by means of ducts located and made a part of the supporting columns of the building. This peculiar feature of the building was designed by C. H. Veeder, the president of the company, and adopted by The Berlin Iron Bridge Company in their design.

Particular notice is called to the sides of the building which are made almost entirely of glass, but arranged in sections so that they can be easily opened and closed, thus securing plenty of fresh air. A great many people have an idea, if the sides of a building are made of glass, that the interior in warm weather will be insufferably hot, the same as a greenhouse. The facts of the case are exactly opposite. Owing to the superior ventilation secured by means of every other panel of the glass swinging on a centre pivot, perfect ventilation may be secured, and thus, instead of being exceedingly hot in warm weather it is extraordinarily cool, and pure clean air from the outside is furnished for the workmen.

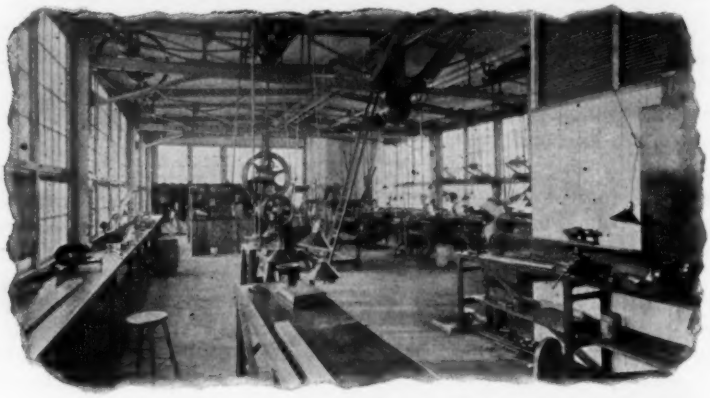


FIG. 3.

Fig. 3 is also taken from a photograph and shows the interior of the upper floor of the building. This floor is entirely clear of columns, the roof trusses being of sufficient capacity to support not only the roof loads but also to carry shafting, pulleys, hangers, etc. Particular attention is again called to the lighting of the interior of this portion of the building. A large amount of glass admits and diffuses the light so thoroughly in and through the interior of the building that the very fine cyclometer work can be carried on in the centre of the building as well as on the outside. The building is a credit to the designers—The Berlin Iron Bridge Company—to whom we are indebted for the illustrations.

DYEING DEPARTMENT.

Dye Recipes for August.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 113.

Light Green on Worsted Yarn.

Blue A on 100 pounds worsted yarn.

Prepare dye bath with

4 oz. Patented Blue A.
(Victor Koechl & Co., 122 Hudson St., New York.)
2 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

These patent blues are well known colors among dyers, on account of their level dyeings, both alone and in combination, and also for their fastness.

RECIPE NO. 114.

Pink on Worsted Yarn.

Rouge de Lyon on 100 pounds worsted yarn.

Prepare dye bath with

1 lb. Rouge de Lyon.
(Sykes & Street, 85 Water St., New York.)

Enter in yarn in cold bath, bring to boil while turning, and turn 15 minutes at that heat.

Fine shades of rose color and pinks can be obtained with Rouge de Lyon, and on account of its working evenly on the fibre, it will make a valuable color for dyers. The fastness of this dye to soap, light and sulphur fumes, makes it a complete and an excellent color. (See Recipe 122, this issue, also 97 in our July issue.)

RECIPE NO. 115.

Brown on Cotton Knit Goods.

Rhine Brown G on 100 pounds cotton knit goods.

Prepare dye both with

3 lbs. Rhine Brown G.
(O. S. Janney & Co., 8-10 Letitia St. Philadelphia, Pa.)
2 lbs. Soda.
20 lbs. Common Salt.

Enter in cloth at boil, and run one hour at that heat. Less color is required for a second bath.

Rhine Brown G. and the other grades of Rhine Browns of the above firm have the same characteristics, and their treatment is the same. (See Recipe 116, this issue.)

RECIPE NO. 116.

Brown on Knit Goods.

Rhine Brown G. on 100 pounds cotton knit goods.

Prepare dye bath with

3 lbs. Rhine Brown G.
(O. S. Janney & Co , 8 10 Letitia St., Philadelphia, Pa)
2 lbs. Soda.
20 lbs. Common Salt.

Enter in cloth at boil, run one hour at that heat; lift out and turn 15 minutes at boil in separate bath, to which has been added

1 lb. Bi-Chromate of Potash.
2 lbs. Blue Vitriol.

Rinse.

By topping Rhine Brown G. after dyeing with Bi-Chromate of Potash and Blue Vitriol, a very fast shade is produced, which is fast to light, air and fulling. The cost of dyeing by this method is small. (See Recipe 115, this issue.)

RECIPE NO. 117.

Yellow on Cotton Yarn.

Diphenyl Fast Yellow G. on 100 pounds cotton yarn.

Prepare dye bath with

1 lb. Diphenyl Fast Yellow G.
(John J. Keller & Co., 104 Murray St., New York.)
20 lbs. Common Salt.

Enter in yarn at boil, and turn an hour at that heat.

Diphenyl Fast Yellow G. is a very concentrated dye, very soluble in hot water, producing a fine shade of golden yellow, and like Diphenyl Citronine G. (see Recipes 101 and 106), has all of the same advantages of that yellow.

RECIPE NO. 118.

Reddish Brown on Cotton Yarn.

Diazyl Brown G. on 100 pounds cotton yarn.

Prepare dye bath with

2 lbs. Soda.
20 lbs. Salt.
3 lbs. Diazyl Brown G.
(C. Bischoff & Co., 87 Park Place, New York.)

Enter in yarn at boil, and turn one hour at that heat.

The full rich shade of brown shown here will be found of interest to dyers. The dye will produce light or dark shades perfectly level; and for a one-dip brown, it will be found much cheaper than cutch. It is fast, and is quickly applied. It dyes cotton and wool, and cotton and silk, in one bath, and the color can be discharged. (See Recipe 121, this issue.)

RECIPE NO. 119.

Red on Worsted Yarn.

Acid Rubine on 100 pounds worsted yarn.

Prepare dye bath with

2½ lbs. Acid Rubine No. 3110.
(Hanna-Schoellkopf Co., Philadelphia, Pa.)
4 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

Acid Rubine No. 3110 dyes a fine shade of bluish red, with a mellow tone. The color works slowly and level, which will be found excellent for piece goods, and as the color is fast and very soluble, the dyer will find it to be a very satisfactory dye-stuff.

RECIPE NO. 120.

Black on Worsted Yarn.

One-dip Wool Black on 100 pounds worsted yarn.

Prepare dye bath with

17 lbs. One-Dip Wool Black No. 2.
2 lbs. Oxalic Acid.
¼ lb. Sulphuric Acid.

Enter in yarn at from 180° to boil, and turn 1½ hours at that heat.

With 17 lbs. of Wool Black No. 2, a fine, full, clean shade of black is dyed in one dip, very fast to soap and light. It will not rub off or bleed, and will dye very level, penetrating the thickest fibre. (See Recipes 161 [1897], and 9 and 79 [1898.])

RECIPE NO. 121.

Lilac on Cotton Yarn.

Diazyl Brown G. on 100 pounds cotton yarn.

Prepare dye bath with

1 lb. Soda.
10 lbs. Salt.
4 oz. Diazyl Brown G.
(C. Bischoff & Co., 87 Park Place, New York.)

Enter in yarn at 140° F., bring to boil while turning, and turn one hour at that heat.

Diazyl Brown G. will dye cotton and wool, and silk and cotton in one bath. It will also combine with other Diazyl colors, for other shades. The color is very soluble, works level on the fibre, and penetrates thoroughly. (See Recipe 118, this issue.)

RECIPE NO. 122.

Bright Red on Worsted Yarn.

Rouge de Lyon on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. Rouge de Lyon.
(Sykes & Street, 85 Water St., New York.)

Enter yarn cold, bring to boil while turning, and turn 15 minutes at that heat.

The fine, rich shades of rose color produced with Rouge de Lyon, and the

quick way of dyeing, will be of great help to dyers, as there is no mordant required in the dye-bath, and the bath does not exhaust. Level shades are the results. (See Recipe 97 in our July issue, also 114, this issue.)

RECIPE NO. 123.

Blue on Cotton Yarn.

Triamine Black B on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Triamine Black B.
(A. Klipstein & Co., 122 Pearl St., New York.)
15 lbs. Glauber's Salt.

Enter in yarn at boil, and turn one hour at that heat.

Triamine Black B dyes in one bath, a fine, full shade of indigo blue, working slowly and level on the yarn. It can also dye a fine fast black, by diazotizing, and developing the color separately. Triamine Black will combine with the direct dyes for shading.

RECIPE NO. 124.

Black on Cotton Yarn.

Zambesi Black D on 100 pounds cotton yarn.

Prepare dye bath with

5 lbs. Zambesi Black D.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
25 lbs. Glauber's Salt.
2 lbs. Sal Soda.

Enter in yarn at boil, and turn one hour at that heat. Rinse and diazotize with

3 lbs. Nitrate of Soda.
9 lbs. Muriatic Acid.

Turn 15 to 20 minutes cold; rinse off, and develop in a cold bath with

1¼ lbs, Beta Naphthol.
1¼ lbs. Caustic Soda.

Turn 15 to 20 minutes and wash.

Zambesi Black D, when developed with Beta Naphthol, gives a bluish black; but a deeper and more of a jet black can be obtained if developed with Toluylene Diamine. If developed with Recorcin, a fine shade of black is obtained. This black is well known to dyers, and is used for fast colors.

RECIPE NO. 125.

Green on Cotton Yarn.

Benzo Green BB on 100 pounds cotton yarn.

Prepare dye bath with

2 lbs. Benzo Green BB.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
20 lbs. Glauber's Salt.

Enter in yarn at boil, and turn one hour at that heat.

Benzo Green BB being a concentrated color, will produce dark shades of green at a low cost, and being a one-dip color, it will be found of great benefit to dyers for combining with other direct dyes. The dye is very easily dissolved, and works on the yarn, raw stock, or piece goods very evenly.

RECIPE NO. 126.

Very Dark Blue on Woolen Yarn.

Alizarine Lanacyl Navy Blue B on 100 pounds woolen yarn.

Prepare dye bath with

3 lbs. Alizarine Lanacyl Navy Blue B.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter in yarn at 120°, bring to boil while turning, and turn one hour at that heat. Then add

5 lbs. Acetic Acid.

Turn 20 minutes at boil.

The shade shown here is a fine, dark bloomy indigo blue, very fast to light and fulling. The importer has several brands of these blues, which will be of great help to the dyer, as he will be able to produce most any shade of blue without a combination of two or more colors. (See Recipe 110 in our July issue.)

RECIPE NO. 127

Red on Worsted Yarn.

Fast red on 100 pounds worsted yarn.

Prepare dye bath with

2½ lbs. Fast Red.
(Anchor Color Mfg. Co., 462 Cherry St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

Fast Red being an acid color, is very well adapted to dyeing fast, bright shades from carpet yarns to wool dress goods, also raw wool, and, in fact, all kinds of fine or low grades of wool and shoddy. It is a very fast color, dyes level, and combines with other dye-stuffs. The cost of dyeing is very cheap. The color is fast to rubbing.

RECIPE NO. 128.

Black on Cotton and Wool Goods.

Black on 100 pounds mixed cotton and wool goods.

Prepare dye bath to start with

40 lbs. Logwood Liquor No. 65.
(Stamford Mfg. Co., 133 Front St., New York.)
4 lbs. Blue Vitriol.
4 lbs. Soda Ash.

Enter in cloth at boil, run 1½ hours at that heat, shut off steam, add

20 lbs. more of Logwood Liquor.

Run one hour at 130° F., lift out, and run 20 minutes in bath to which

2 lbs. Bi-Chromate of Potash

has been added.

Use one-third less dye-stuff for standing kettles.

The above method of dyeing a one-dip black will be found a cheap one. For a low grade mix of wool, shoddy and cotton, the black produced will show up to be a clean and bright one. The above amount is for a starting kettle, and for standing kettles the cost of dyeing is very low. (See Recipes 36 [1897] for black on shoddy; 88 [1897] for a black on cotton; 180 [1897] for a black on shoddy cloth; and 74 [1898] in combination with other dyes for a black on cotton yarn.)

New Dyes.

We present in this issue a number of dyes that are well worth the attention of dyers and manufacturers that desire to keep abreast with the times.

In recipe 113 is to be found an excellent formula for dyeing light green on worsted yarn, by the use of Patent Blue A, from Victor Koechl & Co., New York. This color is exceedingly fast to milling when dyed either with acid or Glauber's salt alone, or on a chrome and tartar mordant. It is quite fast to light. It does not stain white or bleed at all, and is used largely for topping and greening Alizarine Blues.

We think dyers will be interested in recipes 115 and 116, of two shades of brown on cotton knit goods, obtained from Rhine Brown G, furnished by O. S. Janney & Co., Philadelphia. We direct attention to the comments of our dyer in regard to these colors.

John J. Keller & Co., New York, furnish their Diphenyl Fast Yellow G for recipe 117 for a yellow on cotton yarn. This color does not change by the action of acids or hot pressure. It is more adaptable for cotton dyeing, although on account of its being able to stand acid, can also be applied to both wool and silk.

Diazyl Brown G, furnished by C. Bischoff & Co., New York, appears in recipes 118 and 121, for the production of a reddish brown and a lilac, respectively, on cotton yarn. This color is exceedingly well fitted for dyeing cotton hosiery, as it gives a tan shade that is very much in demand, and by shading a little more on the reddish side or making a little darker, a great variety of shades may be obtained.

In recipe 119 we find a formula for a red on worsted yarn, obtained from the use of Acid Rubine, furnished by Hanna Schoellkopf & Co., Philadelphia. Our dyer's comments will be read with interest in regard to this color, and the sample that appears in our Dyers' Supplement will undoubtedly attract attention.

In recipe 124, the New York & Boston Dyewood Co., New York, supply their Zambesi Black D, for the production of a black on cotton yarn. The valuable properties which most of the members of this group of Zambesi colors possess, both in direct, as well as in diazotized and developed dyeings, are embodied in this product to a particularly high degree. This color

is chiefly for cotton, but also can be advantageously employed for dyeing union materials, such as half-wool and half-silk, etc. This house has got out a later color, known as Zambesi BBB, which we shall show in our Dyers' Supplement at an early date.

Benzo Green BB, furnished by Farbenfabriken of Elberfeld Co., New York, is shown in recipe 125, for a shade of green on cotton yarn. This is a bluer brand than Benzo Green G, which made its appearance about a year ago. Benzo Green BB possesses exactly the same properties as the older G brand, and is therefore suitable for cotton, half-wool and half-silk dyeing. Its fastness to alkalies is especially noteworthy. For printing, this BB product has also similar properties to the G brand, and can also be discharged white, with zinc and tin, and sets wool for slop padding.

In recipe 127 is to be found an attractive formula for a red on worsted yarn, produced from Fast Red, furnished by the Anchor Color Mfg. Co., New York. Our dyer's comments in relation to this dye will be read with undoubted interest. The color is a strong article and economical in its use, dyeing uniformly, and is excellent for mixing with other colors to obtain different shades.

Eucalyptus Fibre.

A NEW TEXTILE MATERIAL.

A rather interesting invention has been patented in this country by a Frenchman, the commercial merits of which we have no knowledge and are unable to judge of them from the description that we have received. The invention relates to an improved fibrous material, which has been called by the name of "Eucalyptus wool or wadding," and to the process of producing the same. The fibrous material is obtained by the treatment and utilization of the fibrous portion of the well-known plant designated under the generic name of Eucalyptus. C. R. Dodge of the Department of Agriculture, Washington, in his descriptive catalogue of "Useful Fibre Plants" refers to Eucalyptus as a tree abounding in Australia and Tasmania, and sometimes found in other countries. The tree oftentimes grows to a gigantic size and is exceedingly valuable for its timber. Eucalyptus oil has attracted some attention in late years, particularly since the Philadelphia Exhibition of 1876. The tree is well-known through its having been recommended for planting in malarial districts of this country. The fibre is reddish in color and has been prepared experimentally. The aborigines of Australia are known to manufacture both canvas and cordage from the fibre, which would seem to indicate not only strength, but considerable fitness.

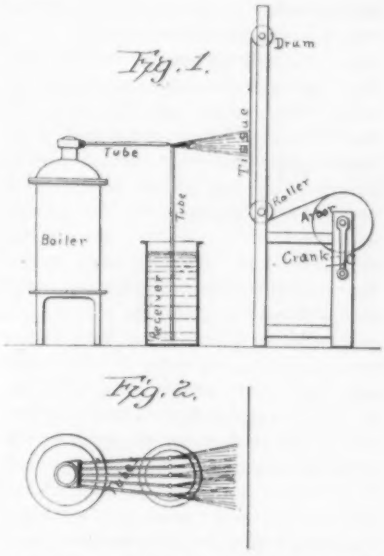


Figure 1 is a side view, partly in section, of an apparatus for restoring to the fabric certain ingredients which are lost in the baths. Fig. 2 is a plan view of part of Fig. 1.

Although the Eucalyptus fibres can be treated by all the processes generally used for the conversion of ligneous fibres into textile threads, the inventor prefers to work according to the following process, which better suits their special nature.

The parts of the plant to be used are

first allowed to soak for about fifteen to twenty hours in a bath of luke warm water. They are then heated in a boiler or in a kier, the temperature being raised progressively by 10° every half-hour until 120° is reached, which brings the total duration of this operation up to about five hours. The fibrous mass is then rolled and brought into the form of very thin ribbons or strips, then washed in a five per cent. bath of carbonate of soda or in any other equivalent alkaline bath. The fibres are then beaten and afterwards thoroughly washed with water, again beaten and placed for twenty-four hours in a bath of luke warm water, to which has been added ten per cent. of hydrochloric acid and one per cent. of ammonium chlorid, (sal-ammoniac.) In place of the hydrochloric acid and sal-ammoniac there may be employed any other acid and any other suitable ammoniacal salt or alkali salt. After this treatment the mass is subjected to a washing with resin soap, then to a washing with plenty of water, which will free it from all free and soluble bodies. Afterward the fibres are dried, scutched, and stripped, and when thoroughly dry are ready for the cards to make wool or wadding.

In order to make up for loss of useful principles resulting in the treatment which the fibrous matter undergoes, the resins collected in the course of this treatment are restored to the wadding in the following manner: The residue from the treatment of the fibrous matter contains oil of eucalyptus, resins, tars, various essences, etc. This residue is placed into a receiver (see illustration), into which a certain number of vertical tubes dip. At the upper extremity of each of these tubes is a horizontal tube which is set into the dome of a boiler. The various tubes are arranged in a common horizontal plane and diverge in the manner shown in diagram, so that they cover the whole width of the stuff to be impregnated. The steam which escapes through the mouthpiece of each of these horizontal tubes produces aspiration in each of the corresponding vertical tubes, so that the resins, tars, essences, etc., in the receiver rise into the vertical tubes and are projected upon the tissue by the steam-jets escaping from the extremity of the horizontal tubes. The tissue to be impregnated is rolled up on a drum. It descends in vertical direction to the horizontal tubes, passes on a roller, and finally rolls upon an arbor which has a crank. Turning the latter slowly the progression of the tissue is obtained, and in that manner the whole surface of the same will be impregnated with resins.

The eucalyptus threads thus brought to the condition of textile fibres form an improved fibrous material which can be used either as such in the manufacture of all objects into which wool or wadding enters, or it can be utilized in any other desired manner. For instance, the improved material can serve for the manufacture of all kinds of felt or be spun so as to make pure eucalyptus yarn, or mixed yarn, by admixture with other textiles—such as flax, hemp, silk, ramie, wool, cotton, or the like. These pure or mixed yarns can be used alone or serve in the manufacture of all fabrics or knitted goods, either alone or in combination with any other kinds of textile threads. In any case it is said that the products obtained by the application of eucalyptus wool or wadding possess all the hygienic and absorbent properties of the material of which they are composed, and they remain in a good condition for a very long time by reason of the imputrescibility of this material.

Absorption of Tannic and Gallic Acids, and Other Smaller Bodies by Cotton.

The peculiar affinity which exists between cellulose and tannic acid has been a frequent subject of experiment, and is of course of immense practical importance in cotton dyeing processes. Gallic acid, on the other hand, appears to have no "affinity" for cellulose, but no satisfactory elucidation of these facts has, as yet, been put forward.

The theory that the absorption is mainly physical, and is due to capillarity, is hardly reasonable in view of the fact that tannic acid is perhaps the only colloid which is thus absorbed, and it is negatived by the fact that precipitated cellulose has a greater absorptive power for tannic acid than the highly organized cotton fibre.

Another argument against the absorption theory is that wool fibre, which (when once wetted) is very absorbent, attracts very little tannic acid from solution. On the other hand if a chemical union takes place between cellulose and tannic acid the resulting compound must be of a very unstable character, since most of the tannic acid is removed by merely steeping the cotton in cold water, and the whole is removed by boiling in water for one hour.

It is probable that a complete explanation will only be arrived at when the constitution of cellulose is absolutely known.

In the meantime it appeared interesting as a contribution to the subject to determine whether any connection could be traced between the degree of absorption and the chemical constitution of the absorbed substance; and although the results of our experiments have been largely negative in character, may usefully be placed on record.

The substances used were various aromatic phenols of known constitution. In all cases the following proportional amounts were employed:—

1000cc. Distilled Water.
10 grms. Purified Cotton.
1 grm. of Substance.

The cotton was steeped in the solution for three hours in the cold, then removed, and the amount of substance (per litre) in the residual solution was determined.

The method of estimation adopted varied according to the substance dealt with, and the testing of the validity of such methods entailed a large amount of work.

The amount of tannic acid which is absorbed by cellulose under various conditions has been investigated by Knecht and Kershaw. They determined the effect of temperature and concentration of the tannic acid solution when steeped in a solution of steeping for various lengths of time etc., etc. J. Koechlin has also published some results bearing upon the mutual affinity between cotton and tannic acid. He finds that cotton which has been saturated with a solution containing 50 grms. of tannic acid per litre still continues to absorb tannic acid when steeped in a solution containing only 20 grms. per litre. It retains the whole of its tannic acid when steeped in a solution containing 5 grms. per litre,but loses tannic acid in a solution containing 2 grms. per litre.

There are of course two opposing attractions in force when cellulose is steeped in an aqueous solution of tannic acid. The cellulose tends to withdraw tannic acid from the solution and the water opposes this by reason of its solvent power. If the former action is the stronger, tannic acid is taken up by the fibre; if the solvent action of the water predominates, tannic acid is removed; if an equilibrium is established, no absorption or removal ensues.

If it were the fact that no definite affinity exists between cellulose and tannic acid and that mere absorption takes place, there would be a definite point of equilibrium for a given strength (temperature, &c,) of solution and a given amount of cellulose; and if the solution were diluted, tannic acid would at once begin to dissolve from the fibre. As a matter of fact, however, the experiments of Koechlin above referred to, show that cellulose will retain in a dilute solution (5 grms. per litre) the whole of the tannic acid absorbed from a much stronger solution (50 grms. per litre). This clearly indicates the existence of a definite attraction, chemical or otherwise, and also gives some idea of the stability of the product which is formed.

Since there are two opposing forces in play, and, in any given case, the absorption of tannic acid ceases when the condition of equilibrium is established, it is evident that an additional amount of tannic acid can only be ab-

sorbed if the attraction of the cotton is increased, or the solvent attraction of the water is diminished. There is, however, no means of increasing the direct attraction of the fibre, but the relative attraction can readily be increased by adding certain substances to the water; and this results in the fixation of a larger amount of tannic acid from any given solution.

The addition of acetic acid to tannin baths has frequently been recommended, and is a not uncommon practice, but it is probably used mainly with the idea of neutralizing carbonates in the water, or perhaps of retarding the fermentation of the tannic acid. Our experiments show, however, that the lower fatty acids have a specific effect in increasing the amount of tannic acid absorbed by cellulose.

The difference between the action of acetic acid and citric and tartaric acid is worthy of comment, and the fact that hydrochloric acid has little effect on the amount absorbed, while sulphuric acid proves very detrimental, has a considerable practical bearing as affecting the neutralization of hard waters, etc.

Knecht and Kershaw had previously noted that an addition of sulphuric acid or sodium sulphate decreases the amount of tannic acid absorbed, a fact corroborated by our experiments.

Cold distilled water was used throughout the experiments, and it was noted that if the air was previously expelled by boiling and the water cooled in a closed flask, the amount of tannic acid absorbed from such water was somewhat diminished.

As already noted, gallic acid is not absorbed from its solution by cellulose, and this statement holds good for all temperatures and concentrations of solution. The presence of acetic acid, however, induces a slight absorption of gallic acid, though the amount taken up is always much less than in the case of tannic acid, never exceeding 8 or 9 per cent. of the amount in solution.

Formic and propionic acids also induce the absorption of a small amount of gallic acid, but other organic acids and also mineral acids have, as with tannic acid, no such effect.

Cotton appears capable of absorbing only a small amount of gallic acid, even from strong solutions.

Gallic acid gives compounds with iron, antimony, and tin, and would therefore be a useful substance in cotton dyeing if it were absorbed by cellulose. The addition of acetic acid to a tannin bath thus renders about 1/12 of the gallic acid useful, in addition to increasing the amount of tannic acid fixed by about 50 per cent.—Walter M. Gardner in Journal of the Society of Dyers and Colorists.

Mildew Removed by Peroxide of Sodium.

With reference to the article in our July number on "Mildew on Underwear," page 79, we are informed that this can be perfectly removed by immersing the goods in a one-half per cent. bath of Peroxide of Sodium, together with the necessary acid, warming up and keeping this up for one-half to one hour, removing and washing very thoroughly in warm water. All fungi will have been killed in that time through that treatment, while the goods will have suffered absolutely no harm, unless they be colored, and then the process, if correctly carried on, would only have lightened the shade a little, according to the duration of the treatment.

—The progress of the cotton mill industry in China, it is reported from Shanghai, is illustrated by the declaration of a dividend of 3 per cent. on the capital by the International Cotton Manufacturing Co. of that centre, in addition to the appropriation of 30,000 teals to the reduction of the overdrafts from the banks, as the result of six months' working. These profits, it is added, are equivalent to a dividend of 15 per cent. per annum.

—Some of the best selling designs in silk grenadines consist of geometrical leno effects of a simple character in stripe form.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Paper Cutter.

Editor Textile World:

Can you inform us who makes machines capable of cutting paper in irregular shapes same as enclosed samples.

Ontario. L. F.

Thomas Kennedy of 49 Mohawk St., Cohoes, N. Y., makes a machine which we think is adapted to your purpose. While its principal use is for cutting cloth, it would cut many thicknesses of the toughest grades of paper; it is supplied with all the attachments in the way of gauges, rules, etc.

Hammock Machinery.

Editor Textile World:

Will you please give us the name of some manufacturer of machinery for knitting or weaving hammocks. We are thinking of putting in some machinery of this kind.

Alabama. Doncas.

Several large manufacturers of hammocks use machines or looms of their own invention and manufacture. The Crompton & Knowles Loom Works of Worcester, Mass., also manufacture looms for weaving hammocks and we would suggest your conferring with them.

Book on Soap and Candles.

Editor Textile World:

I have recently seen a book on the Art of Manufacturing Soap and Candles, by Adolph Ott, published in 1867, in Philadelphia. I should judge that this book was very useful, and should like to obtain a copy.

Massachusetts. J. A.

The book called for is out of print and very scarce. We do not know where a copy can be obtained. The former publishers of it, we believe to be out of business. There is an excellent work on this subject by William T. Brannt. Price $7.50. 677 pages, illustrated by 163 engravings, that we would suggest as being as good a book as can be now obtained. It is based upon the most recent experiences in the science and practice of soap and candle making, comprising the chemistry for raw material, the machinery and utensils and various processes of manufacture, including a great variety of formulae. We do not know of what use such a book would be to one who cannot afford the expense of fitting up a factory and equipping it with expensive machinery.

Socks, Towels, Etc.

Editor Textile World:

I would like to know where I can get gentlemen's and ladies' socks, towels and handkerchiefs of the cheapest grades.

Maine. M. P.

We would suggest that jobbing houses dealing in such stuff be communicated with, as Brown, Durrell & Co., Boston.

Weight of Sheetings, Etc.

Editor Textile World:

Can you give me the weight of standard cotton sheetings, drills, prints and denims?

Mass. R. R.

The standard weight of sheetings and drills is 2.85 yards to the pound, 36 and 30 inches wide, respectively. Prints and print-cloths are supposed to weigh seven yards to the pound. There is no standard weight for denims. The Amoskeag denims may be taken as the standard for American manufacturers.

Buttons.

Editor Textile World:

Can you give us information about where to obtain nickel buttons, as we are in need of a lot of such goods.

Minn. N. B.

The nickel buttons, we think, are nearly all imported, and, therefore, can be obtained, most probably, of any importing house in such commodities.

Treatise on Finishing.

Editor Textile World:

Can you inform me where I can obtain a treatise on finishing woolen goods, such as fulling, and the different branches of the finishing operation?

Conn. A. A.

There is no work devoted strictly to the finishing department published in the English language. Information suitable for this branch of manufacture can only be obtained in books devoted generally to woolen manufacture. There is a book entitled "The Fuller's Ready Tables," with observations on fulling and the handling of woolen fabrics in the mill, which can be obtained for 75 cents. We might suggest the securing of Robert Beaumont's recent work on Wool Manufacture. Price $2.25. It is difficult to write a book on finishing, as so much depends upon the judgment and experience of the finisher. Rules are out of place in this department. They cannot be rigidly carried out.

Yacht Sails.

Editor Textile World:

I have seen it stated that the sails of the "Defender" were made from ramie. Is this a fact?

Mass. H. C.

We are informed by the makers of the of the "Defender's" sails that they were not made from ramie, as has been currently reported, but cotton duck especially made for them, by the Lawrence Duck Co., Lawrence, Mass. The Herreshoff Mfg. Co. say that this duck proved to be eminently satisfactory in all respects, and was used in all the races of that yacht, in 1895.

French Bleaching.

Editor Textile World:

Can you inform me whether the French process of bleaching is in operation in the United States?

Ky. B. C.

We do not know of this process being used anywhere in this country. Any new process would be difficult of introduction, as the present methods have now been placed upon a very cheap and effectual basis.

Cotton Gin Power.

Editor Textile World:

There is a statement going the rounds that the capacity of a roller gin is about 400 pounds daily, and the capacity of the improved saw gin about 4,000 pounds. Also that the roller gin consumes 71,000 foot-pounds of power for each pound of cleaned cotton, against 35,000 foot-pounds of power for a saw gin, for the same quantity. How is this figured out?

Massachusetts. O. Y.

Our reader may be able to understand how this is obtained from the following demonstrations:

Saw gin: Cleaning 4,000 pounds per day, assuming a day of ten hours. Then 4,000 ÷ 10 = 400 pounds per hour, or 400 ÷ 60 = 6.67 pounds per minute.

Statement that it require 35,000 foot-pounds per pound cotton. Then 35,000 × 6.67 ÷ 33,000 = 7.07 h. p.

Roller gin: Statement that it requires 71,000 foot-pounds per pound cotton. Then cleaning 400 pounds per day of ten hours: 400 ÷ 10 = 40 pounds per hour, or 40 ÷ 60 = 0.667 pounds per minute. 71,000 × 0.667 ÷ 33,000 = 1.435 h. p.

Saw gin: If it takes 35,000 foot-pounds per pound cotton cleaned, then 35,000 ÷ 33,000 = 1.06 h. p. (per pound cotton cleaned).

Roller gin: If it takes 71,000 foot-pounds per pound of cotton cleaned, then 71,000 ÷ 33,000 = 2.15 h. p. (per pound cotton cleaned).

Saw gin cleans 6.67 pounds per minute consuming 7.07 h. p.

Roller gin to clean same quantity would use 14.3 h. p.

Wool Spun Cotton Yarns.

Editor Textile World:

Will you kindly give us the addresses of manufacturers making a low grade of wool-spun cotton yarn in coarse sizes.

K. K. C.

Should any of our advertisers desire to reach our corespondent, we will take pleasure in forwarding their letters.

Hours of Labor.

Editor Textile World:

Is it repugnant to the United States Constitution for a State to pass a restrictive act or law limiting the hours of labor for manufacturing and industrial establishments? Has the question come before the Supreme Court of the United States for decision?

New York. W. B.

This question of the right of a State to pass laws of this kind, so far as the United States Constitution is concerned, has been recently affirmed by the Supreme Court of the United States, in a case involving the validity of an act passed by the State of Utah, regulating the hours of employment in underground mines, etc. This law provided for a period of employment of workmen, limited to eight hours per day, except in cases of emergency where life or property is in imminent danger. This act of the State was violated by a miner, and the case was carried before the Supreme Court of that State, and decided against the employer. The matter was carried to the Supreme Court of the United States on the ground that it was repugnant to the Constitution of the United States, in that it deprives employ-

ers and employees of the right to make contracts in a lawful way and for lawful purposes; also, that it is class legislation and not equal or uniform in its provisions, and deprives employers and employees of an equal protection of the laws, and abridges the privileges and immunities of a citizen of the United States, and deprives him of his liberty, without due process of law. The National Supreme Court decided that the act of Utah was a valid exercise of the police powers of the State, and that it was not repugnant to the national constitution.

Cotton in Japan.

Editor Textile World:

What is the status of the United States in its commerce with Japan, relative to cotton and its manufacture.

Pennsylvania. C. L.

Accordig to the latest authentic statistics, the imports of cotton into Japan amounted to 295 million pounds during 1897, 61 per cent. of which came from British India, and 16 per cent. from the United States. Over 80 per cent. of the total imports of cotton was entered at the port of Hiogo. The United States figures only to an inconsiderable extent in the imports of cotton goods into Japan. These imports are largely monopolized by Great Britian. According to the latest consular report from Japan, for 1897 the importation of American cotton goods was about 465,000 yards, consisting chiefly of cotton drills and duck, and shirtings, gray, white and twilled.

Cotton to Spain.

Editor Textile World:

Can you give me the amount of cotton that was sent to Spain from this country for the fiscal years ending 1897 and 1898.

Ohio. D. P.

The exports of cotton to Spain, in 1896-97, amounted to about 110 million pounds, and in 1897-98, about 120 million pounds. Of course, it is well understood that no exportations have been made from the United States to Spain within the existence of the present war.

Price of Cotton.

Editor Textile World:

With the price of middling at a stated figure, say seven cents, what would be the price of middling stained, low middling, strict middling and good middling.

Boston. J. W.

Taking the price of cotton at seven cents, the price of middling stained should be 6 9/16; low middling 6 9/16; strict middling, 7 5/32; and good middling, 7¼ cents per pound. These prices are based on the rates established by the Revision Committee of the New York Cotton Exchange.

New Orleans Progressive Union.

Editor Textile World:

I have received a circular signed by J. A. Blaffer, manager of the New Orleans Progressive Union, concerning the objects of that organization. Do you know anything about this union?

Maine. F. C. W.

We learn from a New Orleans correspondent that this is an organization of citizens of New Orleans, whose main object is to advertise the advantages of that city. What the organization will amount to remains to be seen, as the experiment is a new and untried one. The men behind it are represented as excellent people, but it is thought that their tendency is to cover too much ground, and go into matters which are not strictly germain to the purposes of the organization. The greatest thing that they have to contend against is the fact that they are somewhat cramped for means.

Horse Power of Engine.

Editor Textile World:

How do you find the estimated horse power of an engine from the size of the cylinder?

Chicago, Ill. —Miner.

In order to estimate accurately the capacity of an engine it would be necessary to know the diameter of the cylinder, length of stroke, number of revolutions per minute, steam pressure at which engine is to operate, and for economical results assume an average cut off of not more than ⅛ of the stroke. From this data a mean effective, or average pressure throughout the stroke is to be calculated.

First find the ratio of expansion. For illustration, assume the following data:

Diameter of cylinder 20 inches; length of stroke 42 inches; number of revolutions 100; boiler pressure 100 pounds; (gauge) and cutoff ⅛ of the stroke.

To find the ratio of expansion, divide the length of stroke in feet (plus the clearance in feet) by the distance the piston has traveled at point of cutoff (plus the clearance in feet). Thus in the above case, assuming clearance to be 3 per cent. or 0.105 feet. $[3.5 + 0.105] \div [3.5 \div (3 + 0.105)] = 3.605 \div 1.12 = 3.21$, ratio of expansion.

From a table of hyperbolic logarithms find the log nearest to this ratio, which in this case is 1.1663. To this log add 1, and we have 2.1663. The following rule

is thus obtained: Multiply the steam pressure as indicated, by gauge to which 14.7 has been added, by 1 plus the hyperbolic logarithm of the ratio of expansion, and divide the product by the ratio of expansion, the quotient will be the mean effective pressure. Demonstrating the given figures. $100 + 14.7 = 114.7$. $(2.1663 \times 114.7) \div 3.21 = 77.4$, M. E. P.

The M. E. P. or mean effective pressure being known, the horse power is found by the following simple method $(P \times L \times A \times N) \div 33{,}000 =$ horse power.

"P" = mean effective pressure.

"L" = length of stroke in feet.

"A" = area of piston in square inches.

"N" = number of strokes per minute.

These are all to be multiplied together and the final product divided by 33,000, thus, $(77.4 \times 3.5 \times 314.16 \times 200) \div 33{,}000 = 515.8$ horse power.

New Publications.

Diamine and other colors. W. J. Matherson & Co., Ltd., New York, have issued, as agents for Leopold Cassella & Co., a number of color cards and pamphlets relating to Diamine and other colors, to which we desire to call attention of dyers. Those interested would do well to communicate with this house in regard to these sample cards, which are very handsomely gotten up. We may mention those relating to Diamine colors on linings. Diamine Nitrazol Browns; Tannin Orange R.; New Phosphine G.; Anthracene Acid Colors; and a pamphlet showing dycing fast to light on covert coatings containing cotton.

Graphite as a Lubricant. This is the title of the sixth edition, revised, of a pamphlet just issued by the Joseph Dixon Crucible Co., Jersey City, N. J., which all those interested in this material should write for, as containing much valuable information. The importance of graphite lubrication is largely due to the development of high speed and great power machinery. The compound engines, the great motors, the heavy shaft lines and gears, now so common in the large power plants and mills, present many new questions of friction and lubrication. So far as graphite in engines for general lubrication is concerned, the material should be absolutely pure and free from grit and the flake of uniform size.

The Angora Goat. By S. C. Cronwright Schreiner. New York, Longmans, Green & Co., 16 mo., 296 pages, with illustrations. This we believe is the most complete and satisfactory work relating to the angora goat that ever was published, although written with special reference to the raising of this animal in South Africa. The work is published under the auspices of the South African Angora Goat Breeders' Association. It takes up the subject under the following headings: The Descent of the Angora from the Wild Goat; Early Records; The Evolution of the Angora; The Original Pure Angora Goat; The Localization of the Original Pure Bred Angora; Crossing the Pure Angora with the Common Goat; Effects of the Crossing; The Mohair Area of Turkey; The Farming of the Angora Goat in Turkey; The Turkish Mohair Trade; Importations to the Cape Colony; The Mohair and Angora Goat Industries of the Cape Colony and of the United States, as well as of Australia. There is one chapter in this work devoted to the ostrich. The illustrations and typography are excellent.

Draw Frames and Fly Frames. By Thomas Thornley. Manchester, Eng: Abel Heywood & Son. The author of this work of over 380 pages, 8 vo., is well known as the author of two excellent works on "Self-Acting Mules" and "Spinning Calculations." This book in design and treatment is essentially a companion volume of the above treatise on the self-acting mule. It is the only work especially devoted to the drawing and roving processes, and is intended to benefit those who are directly concerned in the practical operation of the machines under discussion, with particular stress on the points which will give the best results from machines in their actual manipulation. Among the subjects treated may be mentioned the following: Drawing Frames; Fly Frames—Winding, Building Motion, Differential Motions; Roller Setting and Drawing; Defective Roving Bobbins; How to Put up Frames; etc.

Mechanical Draft for Steam Boilers. By Walter B. Snow. This is a pamphlet of 15 pages, being an abstract of a lecture delivered before Sibley College, Cornell University, April 22, 1898. The author is of the engineering staff of the B. F. Sturtevant Co., Jamaica Plain, Mass. The paper is illustrated and contains much valuable information for those interested in the economical operations of boilers.

Appleton's Popular Science Monthly, for August. New York: D. Appleton & Co. Price $5 per year. This number contains a list of articles of timely interest. The important question of The Education of Women for Domestic Life is discussed by Mary R. Smith; and an interesting geological study by Prof. I. C. Russell is given. Dr. Collier's second article on the Evolution of Colonies will be read with increasing interest. Other articles of prominence are the following: Manual Training School, and Some Uses of the Camera in Zoology. Hon David A. Wells' series of articles on Taxation is continued under the special title of What Should be Taxed and How it Should be Taxed.

The Blue Book, 1898 edition. This textile directory appears in its usual attractive and complete form. This publication has now entered its second decade and each volume seems to show an improvement over the preceding one. This year a list of cotton goods converters in New York City has been added. Besides the Directory of the textile establishments in the United States and Canada, the book contains a list of dry goods commission merchants and dealers in wool and cotton and an extended index of the supply trade. It is published in two editions, one for office use and the other for traveller's use. This annual publication is well known to the trade and will doubtless meet with the usual cordial reception which it deserves.

Cotton. By Christopher P. Brooks, Lowell, Mass. Published by the author. 384 pages, 174 illustrations, principally full page plates. Price $3. This is the most acceptable book on this subject that has been published. The subject has been presented in a remarkably attractive style, and is treated in a manner not to be found elsewhere. Mr. Brooks has considered cotton in its botanical features, its cultivation, preparation for the market, and as an article of commerce, besides giving a full chapter on the commercial uses of the seed for oil, etc. The intention of the author has been to produce a volume that will be of interest to the cotton factor, merchant, broker, and all whose business it is to buy or sell the fibre in its raw or manufactured condition; and to produce a summary of the experiences of many men and many minds, as to the most satisfactory method of cotton culture, that would be useful to the planter. While the book is sufficiently technical, it is also popular, so as to be of interest to the general reader. The author is the director of the American Correspondence School of Textiles, Lowell, author of several excellent works relating to cotton manufacture, a former examiner to the City & Guilds of London Institute, for the advancement of Technical Education, and a member of the United States Bureau of the International Congress on Technical Education. We cannot speak in too flattering praise regarding the merits of this book.

The Philadelphia Textile School of the Pennsylvania Museum and a School of Industrial Art, has issued a very convenient pamphlet regarding its methods and advantages. This pamphlet has been published in order to meet numerous inquiries received from persons residing at a distance from Philadelphia with reference to this school. The whole subject of technical education has been developed in the last quarter of a century and is, therefore, so new that its methods, scope and advantages are not generally known, and the field which it opens to bright, energetic, young men, is still very imperfectly understood and appreciated. The chief advantage which such a school affords is the facility offered for obtaining a broad knowledge of textiles. The studies included in the course of instruction at this school embrace, fabric structure and design, fabric analyses and calculations, weaving, carding and spinning, color harmony, Jacquard sketching and designing, mechanical drawing, chemistry, dyeing and finishing.

Industrial News.

—A. & S. Blumenthal have recently removed their silk velvet factory from New York to Sheldon, Ct., and are now putting in the looms and need about 35 additional weavers, who have had experience on plush or silk. Weavers earn from ten to twelve dollars per week and mill runs throughout the year.

—S. J. Corey, 273 Congress St., Boston, Mass., is a well known dealer of all kinds of dyestuffs, and is the representative of W. F. Stutz, Calcutta, India, in the sale of his indigo. Mr. Stutz is the senior member of the firm of Stutz & Co., London, and has spent forty consecutive years in India as inspector and buyer of indigo, and this long experience has gained for him the reputation of being one of, if not the best, judges of this article of any in the business. He buys for dealers and consumers in all countries, if desired, the seller paying him the usual commission on all sales he makes, so that manufacturers can feel sure that if orders to buy are placed in his hands, they will be sure to get the goods at the lowest possible prices. Mr. Corey also is the American representative of Williams & Co., of Madras, India.

—The Howard & Bullough American Machine Co., Pawtucket, R. I., have received the entire contract for machinery from the Aurora Cotton Mills, Burlington, N. C., for a spinning capacity of 7,000 spindles. This company has also received another repeat order for revolving flat cards from the Mechanics Mills, Fall River, Mass. The machinery furnished by this company for the McColl Mfg. Co., McColl, S. C., is now being put into place. This mill is rapidly nearing completion, and the machinery supplied by the Pawtucket concern includes picking, carding, drawing, slubbing, intermediate, roving and spinning.

—The Berlin Iron Bridge Co., East Berlin, Conn., have received a contract from the New Haven Gas Light Co., New Haven, Conn., for a new fire proof coal shed, 60 feet x 500 feet. The framework of the building is to be of steel, so arranged that the coal cars can be brought into the building on a track supported by the roof trusses, the idea being to provide the maximum storage at the least expenditure of power and room. The Syracuse Construction Co., Syracuse, N. Y., are erecting new buildings in conection with their electric railroad plant, all being designed and the material furnished by the Berlin Iron Bridge Co., East Berlin, Ct. The steel work for the new boiler house in connection with the electric plant of the Peoples Light & Power Co., Jersey City, N. J., is being furnished and erected by the Berlin Co. The boiler house is to be 60 feet x 90 feet, with ample space for large upright boilers.

—A cable received from London, July 25th, concerning the Lowry cotton bale reads thus: "Insurance friends wish bale to show to underwriters. Shall they have it? People here highly pleased. Mills anxious to try it."

—Frank Von Borries, chairman, Commercial Club committee, Louisville, Ky., has been on to the East for information concerning the establishment of a textile department in connection with the Manual Training High School of his city.

—Our advices from the West represent that binding twine is having a heavy sale in that section with an advance over last year's price of 5 cents a pound. It is estimated that 20 to 25 per cent. more twine will be sold in that section this year than last, owing to the larger production of grain.

—B. F. Boyer & Co., manufacturers of hosiery and other yarns, have given up their office at 516 Market St., Philadelphia, and removed it to their mill at Camden, N. J., where all communications should be addressed.

—We are informed that Mr. William Barnett is not now treasurer of the D. J. Hamburger & Sons Co., as reported in our Directory. Mr. Barnett is at present engaged in the manufacture of all grades of wool shoddies, on 164 to 170 Broadway, Albany, N. Y.

—Messrs. Loring Coes & Co., of Worcester, Mass., have issued a folding card that is sure to attract attention. It very cleverly connects the all absorbing interest which the public feels in the Spanish war, and especially the part our navy is taking in it, with their own business of making machine knives for every purpose. The front of the card shows a loop hole in a Spanish fortress giving a glimpse of the view beyond. It is labelled, What the "Dons" see. The card has to be opened in order to find out just what the Dons do see. It is a happy conceit in the way of advertising literature.

—When the works of the B. F. Sturtevant Co., at Jamaica Plain, Mass., were recently extended and re-arranged, it became necessary to remove the boiler plant to such a distance from the previous location, as to render further use of the existing chimney entirely out of the question. Recourse was therefore had to mechanical means of draft production and a Sturtevant fan was installed as a substitute for a chimney. This method has proved so satisfactory that the chimney has just been taken down for the sake of the brick it contained, and the somewhat unusual sight is now presented of a large establishment in which the only evidence of a chimney is that presented by a small steel plate stack extending a few feet above the boiler house roof.

The Western Trading Co. has been incorporated, and has opened a salesroom and office at 423 Broome St., New York City. The company is organized to handle accounts of woolen and cotton mills, and is getting considerable business.

The Stillwel-Bierce Co., Dayton, Ohio, manufacturers of water wheels, have removed their New York office from 123 Liberty St. to more spacious quarters, in the Washington Life Building, 141 Broadway, N. Y. Mr. Aldrich, the manager of the company in New York, reports a very good business at present. He says that the company has just installed two of their largest turbine wheels and built iron flumes and bulk-heads for the City Water Works, at Ogdensburg, N. Y.

The Lowry Cotton Bale.

The following is an extract from a letter received from a prominent cotton operator on the Continent, under date July 12th: "The round bales were today exhibited in my office. We have not touched them beyond taking their covers off, to show how easily it is done. The arrangement of the layers gave universal satisfaction; and the way it is put up, in such a small compass, and so clean and handy could but be admired, and our old commission merchants have gone away shaking their heads, and feeling very much as if another Cayite had been all at once exploded upon them! The question of the tare is giving all our friends here some serious thought, who are rather inclined again to take the Spanish side of this round bale. They were completely turned around when they saw that the layers were crosswise, and permitted of the bale being examined so easily. The round bale is a bale for honest people; it is the only bale with which there will be no swindling on the packing and weighing. On this account it will probably be opposed, and we may not be able to sell all we could wish the first season; but shall be very much surprised, if this little bale does not fight its way right through; and, if all attempts of trusts and monopolies are carefully avoided, we shall see this bale take the place of the old Noah's Ark."

A Meritorious Fire Extinguisher.

The Lunacy Commission of New York, which pays particular attention to protecting the millions of property in its care from fire, has at one time and another spent a great deal of time and devoted a great amount of attention to the matter of fire extinguishers, in its effort to equip the institutions with the very best. A while ago O. J. Childs of Utica, representing the Utica Fire Extinguisher, of that city, presented his apparatus for the commission's inspection. A very careful investigation was made as to the advantages of it and the evidence that the Utica extinguisher is regarded as possessing high merits is found in the fact that the company is now receiving orders from and shipping goods to state hospitals. Others in need of such apparatus, who lack either time or facilities for making such a thorough and comprehensive investigation as was conducted by the Lunacy Commission, can naturally afford to accept its conclusions and feel reasonably certain that they have secured a superior article. One of the great advantages possessed by the Utica Extinguisher is that the parts of the interior construction are made only of pure lead and glass, the two substances which in contact with sulphuric acid are not eaten or destroyed. It has no rubber or other packing, hence its parts are practically indestructible. A Utica Extinguisher can be loaded again and again without requiring any new parts.

Ten Years Old.

The press clipping bureau of which Robert and Linn Luce are the proprietors and managers has recently rounded out its tenth year in business. Starting with a small office on Washington St. in Boston, where all the work was done by Linn Luce, the business has extended and broadened in scope until it now has large offices not only in Boston but in New York, Cincinnati and Denver, employing scores of readers and clerks. The clipping business, until the Luces went into it, had been confined to personal notices, book and theatrical reviews, etc., but they have developed its scope and realized the vast assistance that properly collated newspaper information could be to commercial enterprises and to editors. It enables them to keep posted on any line of information without the necessity of doing a vast amount of personal reading. Few persons can realize the extent of this business who are not familiar with it. The system which has been developed in the past ten years by the Luces in the conduct of this business seems to have reached a point beyond which further progress is improbable. The fact that many of their customers who started with them ten years ago are still with them today is the best evidence that can be offered of the satisfaction which their service gives.

Recent Sales of Mill Shares.

	lowest.	highest.
Barnard	65	65
Seaconnet	90	90
York	530	537½
Lancaster	307½	307½
Hamilton	617½	617½
Merrimack	865	870
Boott	775	775
Massachsetts (Ga.)	112⅛	112½
Massachusetts (Mass.)	78	78¼
Stafford	90	90
Continental	15	15
Great Falls	150⅛	150⅛
Bates	102½	102½
Middlesex	115	115
Nashua	462½	462½
Border City	101	101
Mechanics	65	65
Sagamore	85	85

First Northrop Loom in Fall River.

The Mason Machine Works, of Taunton, Mass., have built and furnished to the Mechanics Mills, of Fall River, one of their Mason-Northrop looms, which is running admirably, and attracting a great deal of attention. It is stated that this is the first and only Northrop loom, at present, weaving in any Fall River cotton mill.

MILL NEWS.

Cotton.

New Mills.

—Alabama, Fort Payne. A large cotton mill will be established here by Congressman M. W. Howard and New England capitalists.

—Georgia, Columbus. There is a movement on foot to build a new cotton factory here.

—Georgia, Covington. Work on the new mill of the Porterdale Mills is now under way. It will contain 15,000 spindles and machinery will probably arrive next month.

—Georgia, Douglasville. Work on the mill of the Western Cotton Mills Co. is now being pushed rapidly forward and the mill will probably be started up within two months.

—*Georgia, Forsyth. The Forsyth Mfg. Co. which is building a new 6,000 spindle yarn mill expects to start up about the first of October. Capt. J. M. Ponder is president. The building is about completed and the machinery will soon begin to arrive.

—*Mississippi, Hazelhurst. The Hazelhurst Manufacturing Company confirms our report of July 8th, that they have in view the establishment of a plant to manufacture yarns and ropes. They will build a new mill; the company will probably have a capital of $50,000; full and complete machinery, including power will be required. Matters are in a very early stage and nothing definite has been done or officers elected.

—Mississippi, Okolona. E. J. Ezell is soliciting subscriptions for a cotton mill and is reported to be meeting with fair success.

—*North Carolina, Concord. The company organized by J. C. Lippard, which we reported in April and later on July first, will be known as the Lippard & Shealy Manufacturing Co. Work on the buildings has been commenced. The mill will be 150 by 50, one story high with engine and boiler room separate. The equipment will be about 3,000 spindles; the product will be twisted yarn.

—*North Carolina, Norwood. The Norwood Cotton Mills, of which we reported details in April, have the construction of their plant well under way and expect to start up about the first of October. This is to be a 7,000 spindle yarn mill. D. W. Coltraine of Concord, N. C. is president and J. A. Tyson of Norwood, secretary and treasurer.

—*North Carolina, Rockingham. Work on the new No. 2 mill of the Peedee Mfg. Co. has been started. Full particulars, including equipment wanted, published in our issue of June 3rd.

—North Carolina, Spray. The Nantucket Cotton Mills, which were organized in March, are at work on their main building. It will be 265 by 75, three stories. James S. McAllister of Worthville, N. C., is the treasurer. At the time of incorporation it was understood that the company would operate a bleachery in connection with their mill, but this has not yet been confirmed.

—*Rhode Island, Pawtucket. We are informed by the Blodgett & Orswell Co. that their new building on Front St. is 178x46, with boiler house 52x24. It will be four stories and of brick. They intend to occupy a part of the new mill with their present business.

—South Carolina, Edgefield. The new mill of the Edgefield Mfg. Co. is nearly completed and start will probably be made in about 30 days. The equipment consists of 3000 spindles and 150 looms.

—*South Carolina, Greenville. The new mill of the F. W. Poe Mfg. Co. is approaching completion and will probably be ready to start up by the first of October. As published in our issue of Sept. 17, 1897, it will give an increased capacity of 15,000 spindles and 304 looms. The mill is now running over time.

—*South Carolina, Orangeburg. The Enterprise Mills have completed the main building of their plant and issued $75,000 bonds to be used in the purchase of the machinery equipment. The ulti-

mate capacity of the mill will be about 11,000 spindles and 350 looms, but it is probable that only about half of it will be installed at first. Full details of this concern were printed in our issue of June 10th.

Enlargements and Improvements.

—Delaware, New Castle. There is a rumor that the Triton Cotton Mills owned by James G. Shaw, which have been idle for the past three years, may be started up, in which case they will be thoroughly overhauled and much of the old machinery thrown out and the plant brought up to date, so as to successfully compete with modern mills. Contains 15,000 spindles and has been operated on warp yarns. Condition of the market will materially affect proposed plans.

—*Georgia, Griffin. Concerning the enlargement of the Kincaid Mfg. Co., reported in our last issue, we learn that the details of machinery are not yet decided. The orders for same will be placed in August and include additional equipment of about 6,000 spindles and 200 looms. Steam power is employed.

—Maine, Biddeford. Some changes are being made at the Laconia Co., which include new spinning frames, new looms and re-arrangement of several of the departments. This work will be done during the summer.

—North Carolina, Concord. The Odell Mfg. Co. is to replace its old spinning machinery with new equipment.

—*North Carolina, Durham. The equipment of the new addition at the Durham Cotton Mfg. Co. will be 5400 spindles and 160 looms.

—*North Carolina, Monroe. The Monroe Cotton Mills, which were recently reported as considering an addition to their plant, have decided to take early steps in the matter and will probably double the capacity, which is now about 8,000 spindles.

—South Carolina, Clio. Red Bluff Mills will increase its power plant and would like to correspond with engine and boiler manufacturers, relative to a plant of about 100 horse power.

—South Carolina, Columbia. The Richland Cotton Mills, of which J. S. Moore is treasurer, is building a new machine shop and adding a spooling department.

—Tennessee, Jonesboro. Foundations for the new mill of the Jonesboro Yarn Mill have been started and work will be pushed forward rapidly.

Mills Starting Up.

—*Alabama, Birmingham. The new Avondale Mills will soon be turning out cloth. The engine is running and the machinery is being limbered up.

—*Massachusetts, Whitinsville. The cotton mills controlled by Whitin Bros. at Saundersville, Whitinsville and North Uxbridge, which were shut down for two weeks, started up July 11th.

—Sutoh Carolina, Rock Hill. The Victoria Mills, formerly the Globe Mills, have started up.

Mills Shutting Down.

—Massachusetts, Millbury. The Millbury Cotton Mills, which are owned by J. H. Mason & Sons, have shut down for an indefinite period, owing to the financial embarassment of proprietors. It is a print cloth mill. They also operated the mill at Rockland, R. I.

—Massachusetts, Salem. The Naumkeag Mill shut down for the first two weeks in August, during which time new machinery will be installed.

—North Carolina, McAdenville. The McAden Mills will close down during August and put in a new water wheel and make other repairs and improvements.

—Rhode Island, Bristol. The print cloth mills of the Richmond Mfg. Co. will be closed down during August. They operate 11,000 spindles.

—South Carolina, Charleston. It is reported that the Charleston Cotton Mills are running out stock, preparatory to shutting down all but the yarn department.

Woolen.

New Mills.

—*Kentucky, Phil. O. C. Russell & Co. inform us that they are rebuilding the Green River Woolen Mill, which was recently burned, and expect to have same ready to start by July 15. This is a one-set mill, 40-inch cards, 4 looms, steam power, employs ten operatives, has a dye-house and product is jeans, linsey, flannels, yarns and blankets.

—*Maine, Corrina. C. A. Greenwood, whose mill was recently burned, will remain at this place. It was reported that he might remove to Dexter. Some of the town's people will build a new mill for him, 45 by 100, which will give double the capacity of the old mill. It is expected that the new mill will be in readiness to commence business by the first of November.

—*Maine, Oldtown. Messrs. Lockwood, Greene & Co., have been retained to draw plans for the new mill here to be known as the Ounegan Woolen Mill. The Bodwell Water Power Company which owns all the water power at Oldtown, is to improve its privilege and the new mill take its power from the Bodwell Co. It is to be a four set mill and will be pushed to completion as rapidly as possible.

—*Michigan, Sault Ste. Marie. G. J. Griffin has sold a half interest in his new woolen mill, now nearing completion, to A. E. Cullis, and the business will be conducted under the firm name of Griffith & Cullis. The mill will be started within a few days.

—New Jersey, Lincoln. The new woolen mill in course of erection is expected to be completed according to contract September 1st.

—*New York, Amsterdam. The sale of the No. 3 Warner, De Forest Mill, reported last week, has been made, and possession will be taken by the new owners August 1. H. T. Waterbury, of Oriskany Falls, acts for the new proprietors and is also interested financially himself.

An Englishman, named Hepworth, will be superintendent. One-story dyehouse 150 by 40 will be built, and it is the present intention to build another addition later on. It is expected that the plant will be started up in September and that it will manufacture fine line of men's suitings. The Board of Trade failed to raise the amount required to build the retaining wall, and so purchasers take the property without any guarantees.

—*Pennsylvania, Hulmeville. Frederick Rumpf & Sons' new mill is nearing completion. It is roofed in. Contracts are now being let for the tenement houses.

—South Carolina, Laurens. The talk about the woolen mill project has been revived.

Enlargements and Improvements.

—*Maine, North Monmouth. We have further information regarding the addition to the Annesbescook Mill of which M. C. McIlroy is proprietor. Addition will double capacity, includes 24 new looms and 3 sets of 48 inch cards, giving them a total capacity of 6 sets and 40 looms, dye house and water power. Machinery equipment has been nearly all contracted for.

—Maine, Sanford. The Goodall Worsted Company has leased the weave room of the Springvale Cotton Mills and is changing over the looms to run on linings. The cotton mills are now making hosiery and warp yarns and have given up weaving.

—Maine, Winthrop. The addition to the Winthrop Mills is being roofed in; it will contain the new picker rooms and an elevator.

—Massachusetts, Clinton. The Sterling Worsted Co., which recently started its new mill, is now building a one story addition, 30x50, to be used as a dye house and store room.

—*Massachusetts, Clinton. The new building of the Clinton Worsted Co., which will be built at the north end of their Water St. mill, will be 50x110 and at the South end another building will be put up, 60x120. Contract for the first of these buildings was let last week to the Clinton Wall Trunk Mfg. Co. for $6,455. John S. Allen, architect, Clinton.

Massachusetts, East Dedham. The Cochrane Carpet Mill is to be enlarged by a two-story brick building, 60x100.

—Massachusetts, Fitchburg. The Star Worsted Co. is putting in two new 125 h. p. boilers in addition to their present plant, which will make a total boiler capacity of 400 h. p.

—Massachusetts, Ipswich. The Ipswich Mills are building a new picker house.

—Massachusetts, Lawrence. Some additions are being made to the woolen mill of George E. Kunhardt, principally in the wool and shipping departments.

—Massachusetts, Otter River. A new dye house will be built for the River Mils. The old building is now being torn down.

—Massachusetts, Spencer. A. L. Taft is making some additions to the machinery equipment of the mill recently purchased by him, which is running to its full capacity.

—New Hampshire, Hinsdale. C. J. Amidon & Sons are building an addition to their woolen mill, 15x30.

—New Hampshire, Tilton. The Elm Woolen Mills Co. are building a large addition at one of their mills. Some new equipment, including water wheels, will be added later.

—New Jersey, Camden. An addition 30 by 60 is being made to the Highland Worsted Mills, 9th and State Sts.

—New York, Fulton. The Fulton Worsted Mills have let contract for a large addition, 200x70, three stories, to Geo. W. Barlow; and it is expected that the building will be completed by Oct. 1st.

—New York, Madrid. The Madrid Mills are making some improvements in their water privilege, preparatory to putting in a larger water wheel. They will furnish power for the electric light plant of the town. The mills have been closed for some time.

—*New York, Waterloo. The Waterloo Woolen Mfg. Co., which has been very busy of late, is now running looms in what was formerly the Waterloo Knitting Co.

—Rhode Island, Woonsocket. Harding & Gilleran now operating 20 looms are contemplating adding about 10 more.

Mills Starting Up

—Connecticut, Stamford. The Rippowan Mills Co., which was closed down for some weeks, has been started up, and is now running night and day on plush goods, horse blankets, etc.

—Connecticut, Thompsonville. Hartford Carpet Co., which has been shut down for a few weeks has started up again.

—Illinois, Lanark. The Lanark Woolen Mills which have been idle for a considerable period, have been purchased by William Whitfield & Sons, formerly of Maquoketa, Iowa, and will start up as soon as possible. Some repairs and changes will be made.

—Maine, Dexter. The Morrison Woolen Co. is starting up on orders and will soon be running to its full capacity. It has received its warps.

—Maine, Pittsfield. Walker's Woolen Mill is being started up.

—Massachusetts, Chapinville. E. W. Chapin's mill has been leased to L. Bachmann of New York and the plant is being started up and will soon be running to its full capacity.

—Massachusetts, Dalton. It is understood that the Hampden Woolen Co. will start up shortly.

—Massachusetts, Great Barrington. The Endrick Woolen Mills have been started up after six weeks shut down, during the absence of Mr. Sheridan, in England.

—Massachusetts, Millbury. Aldrich's Satinet Mill, which has been shut down for a few week,s has started up again.

—Massachusetts, Monson. D. W. Ellis & Sons' Mills which have been shut down for a few weeks have started up.

—Massachusetts, Otter River. The River Mills of the George Whitney Woolen Co., which shut down last April, will be operated under the management of Fred J. Church of Enfield, N. H., who will make cloth to be finished at the Baltic Mills, Enfield.

—Massachusetts, Rochdale. The woolen mill of J. D. Clark Co., which has been shut down for three weeks, started up July 11th. Some new machinery has been put in. The mill of Comins & Co., also started on the 11th after a week's shut-down.

—New Hampshire, Milton Mills. A new company has been organized, known as the Waumbeck Mills Co., capital $60,000 to operate the Waumbeck Mills, which have been idle for several years. Charles R. Pratt of Worcester is president; Merrit F. Whipple, formerly of Rhode Island is the treasurer and general manager. The mill is being overhauled and considerable will be done in the way of repairs and improvements, and possibly some new machinery added. The plant will start up soon on repellants and will buy its cotton warps.

—New Hampshire, Penacook. The mills of the Concord Manufacturing Co. at West Concord and Penacook, which have been closed for some time past, have started up on full time.

—New Hampshire, Rochester. According to local reports there is a probability that the Norway Plains Co. which has been shut down for the past five years will start up before long under new management.

—*New Hampshire, Tilton. The work on the addition to the Elm Woolen Mills will be completed early in August and the mill started up.

—*New York, Dolgeville. One of the Dolge properties, namely Daniel Green & Co. felt shoe factory, has been sold by order of the receiver and bid in by friendly interests, who will start the factory up at once. The sale of the felt factory of Alfred Dolge & Son will take place on August 3rd.

—New York, Schaghticoke. The Schaghticoke Woolen Mills is being started up by E. W. Greenman, the assignee, who will run out the stock of wool and yarn on hand, which is expected to take about four months.

—Oregon, Dallas. The woolen mill of James Shaw, which has been shut down for several months, is about to start up on full time.

—Oregon, Pendleton. The Pendleton Woolen Mills expect to start in full about the first of August.

—Pennsylvania, Philadelphia. Oliver Lupton & Co., who were burned out at American and Diamond Sts., have leased the upper floor of the Warden Mill at the corner of 19th and Allegheny Ave. They are placing orders for new machinery.

Mills Shutting Down.

—Connecticut, Stafford Springs. The Summit Woolen Co. has been shut down for an indefinite time.

—Maine, North Vassalboro. It is reported that the Vassalboro Woolen Mills will shut down for some weeks.

—Massachusetts, Dalton. The old Berkshire Mills will probably be shut down about three weeks in August while the new boiler house and stack are being completed.

—Massachusetts, Ware. C. A. Stevens & Co. will close down their 16 set mill until Sept. 1st. This is the first time the mill has been shut down since '94.

—New Jersey, Somerville. The Somerville Woolen Mill has shut down most of its departments.

—New York, Clayville. The Clayville Woolen Mill has closed down for an indefinite time.

—Rhode Island, Mapleville. The Mapleville Woolen Co. has nearly run out its stock and soon will shut down.

—Vermont, Proctorsville. Proctorsville Woolen Mills are shut down.

Knit.

New Mills.

—Georgia, Atlanta. Application has been made for a charter for the Wahneta Mills with capital stock of $15,000, with privilege of increasing to $100,000. E. S. Munford, George H. Wade and others of Atlanta are interested and it is proposed to build a knitting mill at once. This plant has been referred to before under head of Cedartown, S. C.

—*Georgia, Hampton. The Henderson Knitting Mill has been started up on ladies' underwear with a capacity of 100 dozen per day.

—Michigan, Detroit. A new knitting mill is to be established here by the firm of Freidman, Forrester & Co. Members of the firm were formerly connected with Roth & Freidman, and, later, Joseph Roth & Co., of Toledo. Joseph Rosenfeld, one of the new firm, is at present superintendent for Joseph Roth & Co., and it is probable that a line of goods similar to the latter concern will be made.

—Michigan, Lowell. A knitting factory is likely to be established here by C. E. Clark of the Lowell Woolen Mill and E. S. Cornell, who has for the past seven years been employed by the Lamb Knit Goods Co. at Colon. It is probable that a similar class of goods will be made as at the latter place, namely, gloves, mittens, and other specialties on Lamb machines.

—*New York, Cohoes. As announced in our issue of July 15, Nos. 1 and 2 Mills, of the Victor Mills Co., which were burned in March, will be rebuilt at once. Contracts have been let.

—*Pennsylvania, Coopersburg. The building for the branch mill at this place of M. D. Berger & Co., of Souderton, Pa., will be built at once. Details of this project published in Nov. 26, 1897.

—Pennsylvania, Hummelstown. There is a prospect of a new knitting mill to be established in the building formerly occupied by electric plant. Messrs. W. H. Ulrick, Adam Knull and Joseph Rhoads are interested. Factory is expected to

give employment to 50 or more hands and will manufacture hosiery.

—*New York, Cohoes. It is annnounced that the Victor Knitting Mills Co. has decided to rebuild at once the mill which was burned last March. It is expected that this mill will be 9 stories, of brick.

—*New York, Fishkill-on-the-Hudson. J. H. Murphy & Co., of Cohoes, N. Y., confirm our recent report regarding the establishment of a branch at this place with the view of later removing their entire plant here. The new mill will start Aug. 1st, 1898, employing 175 hands, steam power, 61 knitting machines. Product will be men's and women's ribbed underwear.

—*North Carolina, Lasker. P. T. Hicks informs us that the enterprise in which he is interested has not been organized but will be known as the Lasker Mill Co. The product will be yarns, hosiery and underwear, and will have about 1,000 spindles. It is probable that start will not be made before January, 1899. It is hoped to raise $30,000 capital.

—Pennsylvania, Hazelton. A Philadelphia paper reports that Charles L. Widle of this place has purchased machinery and will start a new knitting mill here.

—Pennsylvania, Wilkesbarre. A new hosiery mill has been established here by a Mr. Mitchell of Paterson, N. J. He operates 20 machines at present under the superintendency of Mr. Battison.

Enlargements and Improvements.

—New York, Little Falls. The Little Falls Knitting Mill will soon build a new dye house, 150x75, contract having been given to C. D. West.

—*North Carolina, Scotland Neck. M. A. Smith, prop. of the new knitting company at this place, which has been running about two months now, thinks of enlarging soon.

—*Pennsylvania, Newville. The Newville Knitting Co. inform us that the building which they have secured will be ready to start up about Aug. 1st, and will employ about 40 hands on cotton underwear. They will use water power and put in 10 new body knitting machines. They have a dye house. This company has a capital of $80,000. Pres. and Mgr. W. S. Woodburn; treas., W. C. Brewster; supt., J. W. Sharpe. W. G. Stewart is also interested. Their product is sold direct.

—Vermont, Bennington. The knitting mill of H. E. Bradford & Co. shuts down in a few days until the first of October. During the shut down an addition will be built to the main mill and a new water wheel and other machinery installed. Besides the higher grade of goods which the firm has made heretofore, they will add to their line a cheaper grade, and it is for this purpose the new machinery is being put in.

Mills Starting Up.

—Massachusetts, Millbury. Portsmouth Mill Company which has been shut down for several months, has started up again.

—New Hampshire, Laconia. The Laconia Knitting Company, O'Shea Bros. proprietors, will start up about August 1st to make samples, preparatory to operating the plant in full. It has been idle for considerable time.

—New York, Cohoes. The plant of the Continental Knitting Company in the old Parsons' Mill, is now running in full, machinery having been set up and put in operation.

—New York, Milton. The financial affairs of Henry H. Bell's Sons Co., manufacturers of eiderdown and stockinettes, have been adjusted, and the works are now running with a full complement of help. In connection with the mill is a garment factory at Poughkeepsie, which is to start up August 1, under the management of W. A. Lawrence.

—North Carolina, Fayetteville. The old Cool Spring Mill has been remoddled by the owner, H. M. Pemberton, and is now producing over 100 dozen pairs of hosiery a day. New machinery has been put in, which is running entirely by water power. About 30 operators are employed.

—*Pennsylvania, Middletown. H. A. Romberger's new knitting mill has been started up and will soon be in full operation.

—*Pennsylvania, Nanticoke. The prospect is that the new Diamond Knitting Mill will be started about Aug. 1st.

Mills Shutting Down.

—New York, Kinderhook. The Kinderhook Knitting Co. shut down on the 16th until new orders are received.

Silk.

New Mills.

—*New York, Delhi. Buildings for the new silk mill, to be established here by Gallant Bros., Patterson, N. J. are about completed and machinery is arriving and being set up.

—*Pennsylvania, Ephrata. The new brick mill for Westerhoff Bros. & Napier is finished and ready for machinery. The two upper floors contain about 150 looms. The second story is to be filled with the winding and warping machinery, and the basement used for shipping and contain the office.

—*Pennsylvania, Parsons. Ground has been broken for the new silk mill mentioned in last week's issue. The buildings will cost about $20,000 and the silk throwing machinery about $18,000. J. H. Gunster of Scranton is principal owner and Mr. Hartman will be general manager.

—*Pennsylvania, Reynoldsville. The new mill of the American Silk Company is approaching completion; production will begin about September 1st, giving employment to 300 persons. Satins, armures, peau de soie and taffeta will be made; 200 looms, steam power, no dye house. Capital $150,000. Joseph W. Place President and Treasurer. Sell direct. New York Office, 69 Wall Street.

—Pennsylvania, Taylor. The Brock Worsted Mill, which never fully got under way and is not now in operation, is being started up by a company in the manufacture of silk goods.

Enlargements and Improvements.

—*Connecticut, Windsor Locks. The new company which has been organized

to run the silk mill is known as the Windsor Silk Co. Arthur H. Bottum, formerly superintendent for Gudebrod Bros. will be general manager. Extensive repairs are being made.

—*New Jersey, Jersey City. Further information concerning the addition to the plant of Carl Stohn's Sons at Jersey City Heights, is to the effect that 150 new looms will be added, giving employment to about 150 persons. It is expected that the work will be completed in October, giving total number of looms of about 300. There will be a dye house. Fancy silk vestings are manufactured.

Mills Starting Up.

—Connecticut, Shelton. A. & S. Blumenthal, who recently removed their silk factory from New York City to this place are putting up additional looms and want about 35 weavers. Plant is now in active operation.

—Massachusetts, Webster. The Stevens Linen Works is shut down for about two weeks during which time general repairs and stock taking will be made.

—New Jersey, Paterson. The Sterling Silk Mill was shut down last week for a few days to make repairs.

—Pennsylvania, Scranton. The Sauquoit Mfg. Co. has been shut down for a few days making repairs to machinery.

Miscellaneous.

New Mills.

—*Pennsylvania, Hazelton. It is reported that the directors of the Hazelton Flax Mill, whose plant was destroyed by fire July 3rd, have decided to rebuild.

—Pennsylvania, Philadelphia. Plans are being drawn for a three-story brick mill and dye house at Fifth St. and Allegheney Avenue, to be occupied by J. R. Keim & Co. Hales & Ballinger are the architects in charge.

Enlargements and Improvements.

—Massachusetts, Fall River. Fall River Bleachery will build a new addition at once. Contract has been placed with the Berlin Iron Bridge Co., of East Berlin, Connecticut. Building 65 feet wide, 200 feet long, with side walls of stone, the supporting frame work being of steel.

—*New Jersey, Montville. Referring to the addition being built by John Capstick & Sons, we learn that the new buildings will be 135 feet square, three stories high, with one story dye house 50x100. The changes are more in the nature of improvement than enlargement, and no increase of the power plant will be necessary.

—New York, Cortland. W. W. Hout wants to purchase the following machines; second-hand machinery will answer if in good condition: 1 small shears alligator to cut to ¾-in. stock; 1 15-lb. Bradley hammer; 1 upset to upset 9-16x3-8 oval stock; 1 double head thread machine, National Machinery Co.'s make preferred. Also small geared press to cut ¼-in. holes through ¼-in stock, 2 at an operation.

—Pennsylvania, Philadelphia. The Firth & Foster Co are building an addition to their works on Emerald St., which will be used for finishing and storage. New machinery will be installed giving employment to about 50 more hands. Improvements expected to be completed about the first of September.

—*Pennsylvania, Philadelphia. Joseph H. Masland & Co., who have recently removed from Bristol St., Philadelphia to Germantown, inform us that they expect to place additional looms, but at present can not state how many or what kind. They manufacture woven hammocks, school bags, etc. Now have 12 looms.

Mills Starting Up.

—Massachusetts, West Fitchburg. The McTaggart Mill, which was recently sold through the office of R. B. Denny, to parties who have since organized the Glen Woolen Co., is being started up, and it is expected to get the weaving running next week.

—*Kentucky, Louisville. The Jute Bagging Mill of Lehman, Krause, Rosenthal, recently removed from Peru, Indiana, has started up, giving employment to about 100. It is operated by steam power, has two sets of machinery and 15 looms.

Mills Shutting Down.

—Rhode Island, Phenix. The Clyde Bleach & Print Works have been shut down this week for annual repairs an machinery.

Failures and Suspensions.

—Delaware, Wilmington. A petition has been filed for the appointment of receivers for the Arlington Mills Mfg. Co., which have been closed for a year past. Creditors and stockholders have agreed on the appointment of Andrew D. Jones of Baltimore and David Lindsey of Wilmington. The application was made by the attorney for Woodward, Baldwin & Co., the selling agents.

—New York, New York. David McCosker & Co., large dealers in woolen and linen goods, 12 Water St., have assigned to Daniel C. Watt without preferences. Liabilities about $50,000. Assets about $100,000. Expected to pay in full.

—New York, Port Jervis. W. H. Wylie, manufacturer of dress and tie silks, etc. has made an assignment to O. P. Powell. Liabilities are reported to be about $20,000. Russell Murray & Co. of New York City are preferred to the amount of $40,000. The sheriff levied on execution in favor of William Ryle & Co.

—Pennsylvania, Philadelphia. Execution has been issued against Uriah Thornton, carpet yarn manufacturer on a judgment note for $33,478. Sale of the machinery and stock follows. Liabilities are said to be about $42,000 and will probably exceed the assets.

—Rhode Island, Providence. The failure of John H. Mason & Sons with mills at Millbury, Mass., is announced with liability of nearly $600,000.

—South Carolina, Fork Shoals. The Oak Lawn Cotton Mills, in which J. R. Hill is interested, has had a receiver appointed.

Fires.

—Maine, Cornnia. The 3 set woolen mill of Chas. A. Greenwood & Co. at this place was totally destroyed by fire July 7th. Loss $25,000, said to be uninsured.

—Massachusetts, Foxboro. Alexander Ross' Wool Scouring Mill at West Foxboro was burned on the 28th with loss of about $15,000, covered by insurance.

—New York, Greenpoint. The fire at the Chelsea Jute Mills caused about $50,000 damage and the plant will be closed for some time to make repairs. Loss fully covered by insurance.

—North Carolina, Gibson. The Standard Knitting Mills, manufacturing seamless cotton hose, have been burned out. Insurance $6,000.

—Pennsylvania, Hazelton. The Hazelton Flax Mills were completely destroyed by fire July 3d. The loss is estimated at $40,000. Insured.

—Pensylvania, Philedelphia. The Chelton Hosiery Mills of Harrison & Mallatratt were damaged by fire to the extent of about $7,000, which is covered by insurance.

—Pennsylvania, Philadelphia. The fire in the building at the corner of American and Diamond Sts., burned out Oliver Lupton & Co., and the Philadelphia Linen Co., damaging the former about $20,000 and the latter $25,000. The Champion Machine Co. were also damaged.

Facts and Gossip.

—Connecticut, Middletown. The Portland Silk Mill which recently removed from Passaic, N. J. to this place is very busy, has increased its capacity and is now giving employment to about 60 hands.

—Connecticut, Willimantic. It is reported that the Moosehead Silk Co., which at present occupies the top floor of the Morrison Bldg. on North St., will be removed to the factory of the Excelsior Web & Tape Co., Hop River, Ct.

—Connecticut, Willimantic. It is rumored that the Hartford branch of the Willimantic Linen Co., now used as a finishing department, employing about 100 hands, is to be moved to Willimantic.

—Georgia, Atlanta. If the plans for a textile department of the Georgia Technilogical School go through as now seems likely, a new building will be erected, which will be equipped with suitable machinery.

—Georgia, Columbus. The Chattahoochee Knitting Mills which are located across the river in Girard are to be sold by order of the court on August 2nd; at foreclosure sale. Mill has been idle for some time. It is equipped with 100 knitting machines for the manufacture of seamless hosiery and it is probable that after the sale it will be re-organized and started up.

—Georgia, Gainesville. Frank Dewar is looking up information relative to the cost of machinery for the manufacture of cotton yarns.

—Indiana, Goshen. The Goshen Woolen Manufacturing Co. has been re-organized, and its capital increased to $31,750. This is a three-set plant which assigned in 1897, and has not been running since.

—Maine, Biddeford. The Biddeford branch of the Saco & Pettee Machine Co. has petitioned the assessors for a reduction of about $50,000 of its valuation, claiming that the valuation placed upon the Biddeford plant is far beyond that for similar equipment at Newton Upper Falls. The management represents to the assessors that if they are treated fairly in this matter, it is its intention to develop the plant, add new machinery and improve its equipment; whereas, if no encouragement is received, it would likely result in giving to the shop at Newton Upper Falls the benefit of the contemplated improvements.

—Maine, Westbrook. The trustees for the first mortgage bond holders of the Westbrook Mfg. Co., foreclosure proceedings of which were started over a year ago, have now taken possession of the plant. There are $300,000 first mortgage bonds and by the foreclosure $400,000 common stock, $152,000 preferred stock and $106,000 second mortgage bonds become worthless.

—Maryland, Baltimore. The Phoenix mill of the Mount Vernon Co. suffered considerable damage by water, caused by the heavy rains, necessitating extensive repairs, which will be made at once.

—Maryland, Ilchester. It is reported that the Thistle Cotton Mills will now go in quite extensively to the manufacture of silk goods, having been experimenting in this line for some time past.

—Massachusetts, Blackstone. Charles Fletcher who has recently bought the Waterford Mills, has made an application to the assessors for reduction of its assessed valuation, which he claims is largely in excess of its true value, and wishes it reduced from $100,000 to $50,000.

—Massachusetts, Fall River. The movement which has been started, looking towards the curtailment of production by the print cloth mills is reported to be making good progress. It is understood that the agreement is not binding unless signed by representatives of three million spindles or more, of which 1,500,000 shall be in Fall River. Secretary Rounseville has the agreement in charge.

—Massachusetts, Fall River. The 18th semi-annual dividend to operators of the Bourne Cotton Mills was paid July 2nd. It amounted to 2 per cent of the wages received by operators from December to July.

—Massachusetts, North Adams. As was predicted in our report of last week, the firm of Strong, Hewatt & Co., takes the Linwood Mills early in August. The mills are at present running out stock for the Barker estate, and when it is completed, the new firm will take possession and make some changes before starting up on fine line of men's wear. They have been getting out their samples in the Blackinton Mills.

—Massachusetts, Spencer. T. H. Gage, Jr., assignee of the Spencer Woolen Mill estate, finds that there is $20,000 available, and it is believed that the creditors will get 40 or 50 cents on a dollar.

—Massachusetts, New Bedford. Site has been purchased for the New Bedford Textile School and preliminary are being drawn.

—Massachusetts, Webster. George C. Moore of North Chelmsford, Mass. has purchased the Chase Mills in Dudley and North Oxford. The mill at Dudley (P. O. Wester) is operated by the Chase Woolen Co., who have leased the plant from John Chase & Sons since the death of F. F. Chase, the senior member. The mill at North Oxford has been idle for some time and may be started up. Prentiss Howard, who has been superintendent and manager of the Dudley Mill will remain. The creditors of the old firm receive 100 cents on the dollar, of which 55 per cent. is in stock of the Chase Woolen Company, 31 per cent. in bonds and 14 per cent. in cash. The Chase Woolen Co. will continue to operate the plant under lease from Mr. Moore.

—Minnesota, Mankato. Messrs. M. G. and W. D. Willard, with M. L. Hixon, have purchased the interest of the National Park Bank, of New York, in the Mankato Knitting Mills, for $16,000. The mills of which the Willards were the former owners made an assignment some time ago. It now seems probable that the Willards and their friends will again acquire control of the property and start up them ill at an early date.

PERSONAL RECORD.

Cotton.

—B. G. Bell has resigned his position as superintendent of the Muscogee mills at Columbus, Ga.

—John Brennan, overseer of carding in No. 2 Howland Mill, New Bedford, Mass., was the recipient of a roll top desk and an oil painting recently, the gifts of his help.

—C. J. Brown has left Augusta, Ga., for the Mountain Island (N. C.) Cotton Mills, where he will be overseer of the carding room.

—P. C. Bryant is now loom fixer at the Alabama Mills, Alabama City, Ala.

—J. B. Caldwell is now night superintendent in the O. A. Robbins Sash Cord factory, Charlotte, N. C. Mr. Caldwell was formerly employed by the Charlotte Cotton Mills.

—George I. Cain, late superintendent of the Monroe Cotton Mills, Monroe, N. C., has accepted a similar position with the Catawba Mills, Chester, S. C.

—John L. Carter, and John Hester and family have left Durham, N. C., for Hillsboro, N. C., where they will work in the Eno Cotton Mills.

—Capt. J. C. Carter, president of the Meridian Cotton Co., Meridian, Miss., has left for a tour through the principal manufacturing centres of England and the Continent.

—J. A. A. Clark, manager of Clark's Globe Mill, Augusta, Ga., has put his son in that mill as overseer spinning.

—Edward Cole has received the appointment as superintendent of the cotton mill at Ramseur, N. C.

—Jeff. Cole, formerly of Winnsboro, S. C. is now with the Roanoke Mills Co., Roanoke Rapids, N. C., where he will be employed as a loom fixer.

—S. L. Cutting has resigned the superintendency of the Gaffney Cotton Mills, Gaffney, S. C. and has accepted a similar position with the Avondale Mills, Birmingham, Ala., rendered vacant by the resignation of E. E. Blake.

—R. L. Doggett has returned to the weave room of the Piedmont, S. C., Mill, after working some time for the Arkwright Mill, Spartanburg, S. C.

—W. A. Foster, formerly of Newbury, S. C., is now superintendent of the Avondale Cotton Mill, Avondale, Ala.

—Charles Gray has been appointed superintendent of weaving at the Rock Hill Cotton Mills Company's mill, succeeding J. G. Suther, who resigned.

—Wm. H. Harper has been appointed overseer of the Pepperton Cotton Manufacturing Co.'s mill at Jackson, Ga.

—W. E. Hartsell has left Gastonia, N. C. for Roanoke Rapids, N. C., where he will oversee the drawing-in room of the Roanoke Mills Co.

—A. S. Haskell, Jr., has been appointed superintendent of the Enoree Mill, Enoree, S. C.

—W. C. Heath, secretary of the Monroe Cotton Mfg. Co., Monroe, N. C. has also been elected to the post of superintendent. William Norris will be his assistant.

—Thomas M. Holman has been engaged as overseer spinning at the Mountain Island, (N. C.) Cotton Mills. He was formerly in a similar position at Mill No. 2, Langley, S. C.

—Benjamin F. Houston is the new superintendent at the Maneta Mill, Lando, S. C.

—J. H. Hunt has resigned his position as overseer of weaving with the Gaston Mill, Cherryville, N. C., and has accepted a similar position with the Spray (N.C.) cotton spinning and weaving mill.

—W. T. Hurley, formerly with the cotton mill at Ramseur, N. C., has been engaged as superintendent of the Smitherman mill, Troy, N. C.

—Mose Inglett has been appointed second hand of spinning at the Avondale Mills, Birmingham, Ala.

—A. M. James, superintendent of the Kindley Mill, Mt. Pleasant, N. C., was recently married to Miss Bessie Misenheimer, of Concord, N. C.

—C. A. Keith has been appointed boss carder for Joseph Wild & Co., Brooklyn, N. Y.

—R. M. Lindsay, of Lowell, N. C., has been engaged by the Newberry, (S. C.) Cotton Mills as head card grinder.

—C. A. Mann, of Charlotte, N. C., has taken a position as second hand in day spinning at the Dover Yarn Mills, Pineville, N. C.

—Scott Maxwell of Rock Hill, S. C. has taken the superintendency of the Millfort Mills, Fort Mill, S. C. Wm. R. Butler, C. H. Gray and Robert Butler, all of Rock Hill, also went with Mr. Maxwell to assume the duties of overseer of cloth room, overseer of weave room and overseer of carding and spinning respectively.

—M. McCoy is the new chief engineer of the Wadesboro Mills, Wadesboro, N. C., succeeding to the position resigned by William McRae.

—C. J. McGuire has resigned the superintendency of the Selma Coton Mills, Selma, Ala., and has moved to Birmingham, Ala. F. M. Stillman, secretary and treasurer of the Selma Mills is acting as superintendent.

—G. A. Mebane has been elected president of the new mill at Spray, N. C.

—John Nelson is the new superintendent at the cotton mill in Jonesboro, N. C.

—Thomas Norris is now dresser tender with the George H. Gilbert Mfg. Co., Ware, Mass.

—S. F. Patterson, president of the Thistle Cotton Mill Co., Ilchester, Md., is now also general manager of one of the new mills at Roanoke Rapids, N. C.

—Arthur H. Paul has been appointed paymaster of the Boston Manufacturing Co., Waltham, Mass. Mr. Paul was employed as assistant paymaster under the late George Clay for several years.

—A. B. Peterson, formerly superintendent of the Richland Mill, Columbia, S. C. is now superintendent of the Stanley Creek Cotton Mills, Stanley, N. C.

—N. C. Richardson is now overseer at the Kincaid Mill, Griffin, Ga.

—Fred Salterie, of the Charleston Cotton Mill, Charleston, S. C. has been promoted to the position of overseer in that mill.

—Walter M. Scranton, formerly of Charleston, S. C. has removed to Oxford, Ala., where he has taken a position as night overseer of the Blue Springs Mills.

—Pat. Skidmore has been appointed overseer twisting, reeling and warping at the Atherton Cotton Mills, Charlotte, N. C., succeeding J. E. Stott, resigned.

—Charles Slack is now night overseer of carding at the Randleman Mill, Randleman, N. C.

—E. A. Smith, president of the Charlotte Supply Co., Charlotte, N. C., has been elected president pro tem, of the Louise Mill in that city until Capt. H. S. Chadwick, the regular president, returns from the war, whither he has gone with his company, the "Queen City Guards," Co. I., 1st. N. C. regiment.

—H. G. Smith has been appointed overseer of weaving in the mill of the Victor Manufacturing Co., Greer Depot, S. C.

—George W. Stapleton, formerly of Clark's Globe Mill, Augusta, Ga., has taken the position of overseer spinning at Mill No. 2, Langley, Ga., formerly held by Thos. M. Holman.

—J. E. Stott has taken charge of the night spinning and twisting for the Gaffney Cotton Mills, Gaffney, S. C. Mr. Stott was formerly overseer of twisting, reeling and warping at the Atherton Cotton Mills, Charlotte, N. C.

—R. H. Tilley has acepted a position as asistant overseer of the spinning room, with the Pee Dee Manufacturing Co., Rockingham, N. C.

—C. B. Thompson, of Clifton, S. C., has been engaged by the Roanoke Mills Co., Roanoke Rapids, N. C. as additional weaver.

—W. T. Troutman is now acting as loom fixer for the Indian Head Cotton Mills, Cordova, Ala. Mr. Troutman was formerly second hand weaving at the Edna Mills, Reidsville, N. C., and later boss weaver at the Blue Spings Cotton Mills, Oxford, Ala.

—John Vance, superintendent at the Glen Riddle Mills, Glen Riddle, Pa., was recently married to Miss Alice L. Beaumont.

—W. J. Welch, of Danielson, Conn., has secured a position as overseer in the Hebron Mfg. Co.'s Mill, Dodgeville, Mass.

—Arthur Wilkins has secured a position as second hand spinning for the Riverside Mfg. Co., Montmorency Falls, Que.

—J. R. Wilson, of the Manchester Mills, Rock Hill, S. C. has taken a position as second hand in mill No. 4 of the Odell Manufacturing Co., Concord, N. C.

—W. H. M. Woods has accepted the position of superintendent of the Natchez Cotton Mills, Natchez, Miss. Mr. Woods was for some years superintendent of the Alpha Coton Mill, Charlotte, N. C.

Woolen.

—A. H. Baker has been appointed secretary and manager of the Carthage (Mo.) Woolen Mills.

—C. H. Blackburn has accepted a position as boss spinner at the Hillsboro Woolen Mill, Hillsboro Bridge, N. H. Mr. Blackburn was formerly boss spinner at the Faulkner Mill, Lowell, Mass.

—Fred Came has been appointed foreman weaver in the Hopewell Mills, South Glastonbury, Conn.

—W. R. Campbell, late of Almonte, Ont., has been appointed assistant superintendent in the Globe Woolen Mills, Montreal, Que.

—S. C. Fagard has resigned his position with the Mascoma Flannel Co., Lebanon, N. H., and is now designing for the Southwark Mills, Philadelphia, Pa.

—Walter Jones has been appointed in charge of the dyehouse of the Dingley Manufacturing Co., Philadelphia, Pa.

—Hugh Gallagher, lately with George Mallison, Chester, Pa., has secured a position with John G. Campbell & Co., Philadelphia, Pa.

—Ernest Harrington has resigned his position as second hand in the finishing room of the Oregon City Woolen Mfg. Co. and has taken the post of overseer of the Albany Woolen Mills' finishing room, Albany, Ore.

—Thomas Hart, Jr. has been engaged to fill the position of assistant superintendent with the Burlington Woolen Co., Winooski, Vt.

—Jas. H. Hendry has been appointed superintendent, designer and general manager of the West Point Woolen Mfg. Co., West Point, Ia.

—William House has been engaged as carder and spinner by the Tell City Woolen Mills, Tell City, Ind.

—William Knox is now boss carder in the Vassalboro Woolen Mills, Vassalboro, Me.

—Thomas McGuirk has resigned his position as superintendent of the Putnam Woolen Co.'s mill, Putnam, Conn., and has moved with his family to Providence, R. I. Mr. McGuirk has been a resident of Putnam for over 30 years and has won the respect and esteem of all who have come in contact with him. As soon as his friends heard that he was about to leave them, they held a gathering at which many of the leading business men of Putnam, headed by Mayor H. C. Fuller were present. Mr. McGuirk was presented with a handsome roll top desk and chair by his friends and associates. The meeting terminated with an entertainment.

—P. F. McGee has resigned the superintendency of the Albany Woolen Mills, Albany, Ore. Mr. McGee had held this position for two years and was also a director.

—John McIntosh, who resigned his position as boss dyer of the Hanover Woolen Company, Hanover, Ill., has returned to Toronto, Ont.

—H. J. Maloney, formerly with Glennon & Bickerton, of Dalton, Mass., has secured a position as boss carder for the Glen Woolen Mills, West Fitchburg, Mass.

—Robert C. Moran is now boss finisher for the Kimball Woolen Co., Huntingdon, Mass.

—George W. Padlen is now dyer at Hinsdale, N. H. His former position at the Lippitt Woolen Mills, Woonsocket, R. I., is being filled by Mr. Devine, late of the Quaker City Dye Works, Philadelphia, Pa.

—Arthur Pillings has resigned his position as overseer of the weaving room in the Bemis Mills, Bemis, Mass.

—Frederick Pohlman, formerly with the Massachusetts Bleach & Dye Works, has been appointed boss dyer for the Burlington Woolen Co., Winooski, Vt.

—Edward Saunders, formerly boss spinner at Hillsboro Bridge, N. H., has accepted a position with the Johnson & Bassett Machine Co., Worcester, Mass.

—E. Schrier is in charge of the new dresser for A. Roberts & Co., Haverhill, Mass.

—J. B. Shaw has resigned his position as overseer in the dye house at the mill of the Dayville Woolen Co. and is succeeded by Mr. Hey.

—John Tuite has been appointed boss dyer at the Faulkner & Colony Mill, Keene, N. H.

—Joseph V. Turner has resigned his position as superintendent of the Camden Woolen Company's mill, Camden, Me. and George W. Taylor of Vassalboro has accepted the position.

—F. P. Ward and T. Byron Harrington have returned to their old positions as weavers for the Broad Brook Co., Broad Brook, Conn.

—L. Wardwell has secured a position as loom fixer for the Camden Woolen Co., Camden, Me.

—David Welsh has returned to his old position as finisher for the Singleton Worsted Co., Franklin, Mass. He has lately been finishing for the French River Textile Co., Mechanicsville, Conn.

—Chas. Whitehead, lately dresser at Franklin Falls, N. H., is filling a similar position at the Hillsboro Mills, Hillsboro Bridge, N. H.

—T. H. Wilkinson, formerly superintendent of the Mississippi woolen and cotton mills at Wesson, Miss., has resigned.

Knit.

—Albert Cup had his arm amputated as a result of an accident which happened July 8, in the knit boots mill of the United States Rubber Co., Woonsocket, R. I.

—F. Thierfelder and R. Becker were engaged to come to this country from Germany, by the Fort Wayne Knitting Co., Fort Wayne, Ind. They were detained for 40 days in New York by the Commissioner of Immigration under the Alien Labor Act. They were released, however, because they were engaged to run machines never before used in America.

Deaths.

—Samuel Cranshaw was drowned while bathing recently. Mr. Cranshaw was a weaver in an Oneyville (R. I.) mill.

—Robert DuBois, formerly president of the East Lake Woolen Co., Bridgeton, N. J., died July 8. Mr. Du Bois was born in Bridgeton in 1827 and succeeded his father in the woolen business.

—Abram Hays, formerly a manufacturer of woolens died in Rochester, N. Y., July 14, aged 80 years.

—P. B. Henry, who has been for many years in charge of the Pacific Mills owned by Lawrence & Co., Boston and New York, died recently at his home in Newton Centre, Mass.

—Z. T. Jackson, engineer of the cotton mill at Union, S. C., died recently.

—John F. Keville, overseer of the weaving department in the Hillsborough Mills, Wilton, N. H., died July 9. Mr. Keville was found dead on his lawn. Cause of death not known.

—Charles Lewis, senior member of the firm of Charles Lewis & Bros., dealers in woolens, New York, died suddenly of opoplexy, July 15. Mr. Lewis had beeen for 30 years in the woolen business at 315 Church Street, New York.

—William Sommerville died at Cornwall, Ont., July 14, aged 46. Mr. Sommerville was born in Colburg, Ont., was at one time connected with the woolen industry in Peterborogh and was formerly manager of the Globe Mills, Montreal. He was manager of the Cornwall Manufacturing Company's Woolen Mill at the time of his death.

—J. W. Stine died at Louisville, Ky., July 6, aged 61. Mr. Stine was president of the Hope Worsted Mills Co. and manager of the Louisville Woolen Mills.

—James Warburton died in Pawtucket, R. I., June 21. He was a resident of Pawtucket for over 50 years and for many years was superintendent for S. H. Green & Sons, Riverpoint, R. I.

—William Wilkinson, cloth inspector at No. 3 mill of Shaw, Esrey & Co., Chester, Pa., died suddenly, July 13. He had worked up till noon the day of his death.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.

D'Este & Seeley Co, 29 Haverhill St, Boston,

Automatic Feeds for Cotton and Wool.

Harwood, Geo. S, & Son, 53 State St, Boston.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.

Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.

See under Yarns.

Belting.

Alexander Bros., 410 No. 3d St., Phila., Pa.
Billington, J. H. & Co., 113 Chestnut St., Philadelphia.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Fell, Geo. & Son, Bolton, England.
Link Belt Machinery Co., Chicago, Ill.
See also Mill Supplies.

Belt Dressing.

Alexander Bros, 410 No. 3d St, Phila, Pa.

Bindings.

See Tapes and Braids.

Bleaching Materials.

Roessler & Hasslacher Chemical Co, 100 William St, New York.

Boiler Compounds.

Carr Manufacturing Co., 69 Beverly St, Boston.
Imperial Chemical Co, 324 American St, Phila, Pa.

Boxes, Cloth Boards, Etc.

Flanders, E A, North Dexter, Me.
Pearson, J. T, Kensington, Pa.

Braids.

See Tapes, Braids and Edgings.

Burr Pickers.

Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.

Ashworth, Elijah, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Calico Printers' Machinery and Supplies.

Butterworth, H. W., Sons & Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.

Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals and Apparatus.

Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.

Adriance, John S., 105 East 39th St., New York.

Cloth Testing Machine.

McKnight, S, 771 Broadway, New York.

Combs (Wool and Cotton).

Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Comber Needles.

Townsend, Thos., Providence, R. I.

Commission Merchants.

Hayes, O. H, & Co, New York.

Copper Print Rollers.

New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

Copper Work for Dyers.

Phillips Co, The Thomas, Providence, R. I.

Cotton (Egyptian).

Stoddard, Haserick, Richards & Co., Boston.

Cotton Machinery.

Altemus, W. W, & Son, 2816 N. 4th St, Phila-Pa.
Ashworth, Elijah, Fall River, Mass.
Cobb, Thad. S., Machinery Co., Lowell,
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Payne, Geo. W, & Co, Pawtucket, R. I.
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R, I.

Cotton Openers and Lappers.

Howard & Bullough American Machine Co, Pawtucket, R. I.

Cotton Presses.

Planters' Compress Co, 89 State St, Boston.

Cutters for Knit Fabrics.

Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

Damper Regulators.

D'Este & Seeley Co. (Curtis), 29 Haverhil St, Boston, Mass.

Designers.

Fresnel, Gustave, 125 W. 56th St, N. Y.

Dextrine.

Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.

Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.

Brophy's, T, Sons, Jasper St, Philadelphia.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Phenix iron Foundry, Providence, R. I.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks,

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Amend Process Co., 205-211 Third Ave., New York.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Cochrane Chemical Co., 50 Kilby St., Boston.
Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Holliday, Read, & Sons, 100 William St., New York.
Innis & Co, 3 Cedar St, New York.
Jaeck Bros., The, Co., 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Matheson, W. J, & Co, 182-184 Front St, N.Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N, Spencer, Elmira, New York.
Webster Dye Works, Webster, Mass.

Dyers and Finishers.

Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.

See Tapes, Braids and Edgings.

Electrotyping and Printing.

Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Eastern Machinery Co, The, New Haven, Conn.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Engineers, Mechanical.

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Express Money Orders and Travelers' Cheques.

American Express Co, offices in every city

Fans—Exhaust and Ventilating.

See Ventilating Apparatus.

Feeders

See Card Feeds.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Fulling Mills for Woolen Goods.

Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.

Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Singeing Machines.

Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.

Boston Belting Co., 256 Devonshire St., Boston.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.

Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila, Pa.

Knit Goods Brushers.

Ardrey, S. B, & Sons, Bristol, Pa
Jones, Lewis, Philadelphia, Pa.

Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
Boss Knitting Machine Works, Elm and Reed Sts., Reading, Pa.
Branson Machine Co., 506 John St., Philadelphia.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lamb Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Little Hustler Napper Co., Hudson, N. Y.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St, Phila, Pa.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Goldstein, J. 416 Arch St., Philadelphia.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lydall, H, & Fouids, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
Bullock & Crenshaw, 926 Arch St. Phila, Pa.

Lamps, Electric.
Beacon Lamp Co, New Brunswick, N. J.
Lynn Incandescent Lamp Co., Lynn, Mass.

Looms.
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1733 Barker St, Phila Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.
Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.
Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.

Machinery Wipers.
American Silk Mfg. Co, 311 Walnut St Philadelphia, Pa.

Machinists' Tools.
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester, Mass.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Douglas Manufacturing Co., Fall River, Mass.
Harwood, Geo. S, & Son, 53 State St, Boston.
Hill, Jas, Mfg. Co, Providence, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Nashua Spool & Bobbin Co, Nashua, N. H.
Spofford, Wm. S, & Son, 5-11 Culver St, Providence, R. I.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Little Hustler Napping Co, Hudson, N. Y.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Novelties.
Stohn, C, 178 Green St, Jamaica Plain, Mass.

Oil Filters.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Crossley & Goddard, 23 Court St, Boston.
Massink, H., Amsterdam, Holland.
Phillips & Anderson, 53 State St, Boston.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.
Dalrymple, George, Fair Haven, Vt.

Perforated Copper
Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

Pipe Covering (Magnesia).
Keasby, R. A. 54 Warren St, New York.
Keasby & Mattison Co, Ambler, Pa.

Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.

See Ventilating.

Power Transmitting Machinery.

Channon, H, Co, 25 Market St, Chicago, Ill.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W. A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.

Presses.

Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Co, Staten Island, N. Y.
Phillips Co, The Thomas, Providence, R. I
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressing Irons, Gas and Air Heated.

Sheftall, C. H, Mgr, 305-307 Mercer St, New York.

Pressure Regulators for Steam and Water.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.

Novelty Textile Printing Co, 447-449 W. 14th St, New York.

Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.

Reed and Harness Manufacturers.

American Supply Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.

Cheney Bros, S. Manchester, Ct.

Roller Skins.

Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.

Armitage Mfg. Co, Richmond, Va.
Johns, H. W., Mfg. Co., 100 William St. New York.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.

Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.

Hill, Jas, Mfg. Co, Providence, R. I.
Laminar, Flore Co., No. Cambridge, Mass.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Sample Cards.

Yerrington, F. M, 17 Batterymarch Street, Boston.

Schools.

Gavey Correspondence School of Textile Design. P. O. Box 222, Brooklyn, N. Y.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.

Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co , 66 No. 4th St , Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Shearing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.

Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.

See Wool Shoddies.

Shuttles.

See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.

Butterworth, H. W. Sons Co, Philadelphia.
Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.

Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co, New Bedford, Ms.

Sizing, Starch and Gums.

American Glutrose Works, Penn Mutual Bldg. Phila, Pa.
Columbia Mfg. Co, 143-151 Pocasset St, Fall River, Mass.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.

Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.

Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 980 Manton Ave, Providence, R. I.

Spinning Frames.

See Cotton Machinery.

Spinning Frames for Wool

Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.

Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.

Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.

Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Damper Regulators.

D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.

Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

Steam Separators.

D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.
Robertson, Jas. L, & Sons, 204 Fulton St, New York.

Steam Specialties.

Butterworth, H. W. Sons Co., Philadelphia.
D'Este & Seeley Co, 29 Haverhill St, Boston
Haines, W. S. C 136 South 4th St, Phila, Pa.
Robertson, Jas L. & Sons, 204 Fulton St, New York.

Steam Traps.
D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S. C 136 South 4th St, Phila, Pa.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.
Friedberger & Co, Germantown, Pa.
Goff, D. & Sons, Powtucket, R. I.
Krout & Fite Mfg. Co., 2632 40 Mascher St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Teasels.
Kellogg, Wm, W, Skaneateles, N. Y.

Temperature Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S. C, 136 South 4th St, Phila, Pa.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, Boston, Mass.

Traveler's Cheques.
American Express Company.

Turbines.
(See Water Wheels.)

Valves.
D'Este & Seeley Co, 29 Haverhill St, Boston Mass.

Ventilating Apparatus.
Allington & Curtis Mfg. Co, Saginaw, Mich., and East Cambridge, Mass.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).
Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches and Clocks.
Elgin, National Watch Co., Elgin, Ill.
Prentiss Clock Improvement Co, 49 Dey St, New York.

Watchman's Clock.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116A Chambers St, New York.

Water Pressure Regulators.
D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.
Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co., Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)
Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool.
Lyon, John H, & Co, 12 Reade St, N. Y.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.
Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.
Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Butterworth, H. W. Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Harwood, Geo. S, & Son, 53 State St, Boston.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.
Barnett, William, 164 Broadway, Albany N. Y.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St, Boston.
Burnet & Co., 24 George Sq., Glasgow, Scotland.
Catlin & Co, New York and Boston.

Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Dana Warp Mill, Westbrook, Me.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Germantown Spinning Co, Germantown, Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Sanford Spinning Co, Fall River, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Indian Orchard Co., Indian Orchard, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

American Spinners' Cotton Yarn Exchange, 226 Devonshire St. Boston, Mass.
Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm, Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Colchester Mills, 86-88 Franklin St, New York.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Burnet & Co., 24 George Sq., Glasgow, Scotland.
Eichman & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Holland & Webb, N. Y.

Mohair Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St.. N. Y.
Goff, D. & Sons, Pawtucket, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Burnet & Co., 24 George Sq. Glasgow, Scotland.
Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Hawes, O. S, & Bro, Fall River, Mass.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
King, Alexander & Co, 54 Leonard St, N. Y.
Rockwell, Edward M, Leominster, Mass.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Elsasser, Albert R, Addingham, Pa.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

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1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

1305 **Superintendent and Designer** with 20 years' experience in woolen mills, on cassimeres, cheviots, worsteds and cloakings. Is now out of employment. Wants position at once.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

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1386 **Woolen Superintendent and** Expert Carder. With experience in both positions. A man of skill and push, now out of work through failure of mill, caused by outside speculation by one of the firm. Age 43; married; Yankee.

935 **Woolen Supt. and Designer.** Graduate of German Textile School. Has managed successfully two mills in the West. Thoroughly up on designing and general mill management. Age 35. Married. References first-class.

1408 **Carpet Superintendent.** Has had management of Phila. and N.J. mills making damask, ingrain, axminster and Smyrna carpets and rugs. Also chenille curtains. 14 years as overseer, 6 years superintendent. Age 42. Married. Refers to mills where he has worked.

COTTON SUPERINTENDENTS.

1337 **Assistant Superintendent.** Expert on book binder's cloth, window shades, fan cloths, friction callender machines. 20 years with Wilson & Bentleys, London, and about 2 years employed in this country. Age 45, married. American and English references.

1332 **Supt. with long experience** in both Northern and Southern mills. Has started 3 Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1265 **Superintendent** wants position as superintendent of cotton cloth mill. Has had charge of each department in the mill; aged 38 years; married.

1266 **Cotton** superintendent wants position. Out on account of mill shutting down. Understands fancy and plain cottons, white and colored. Has a first-class record.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

1184 **Cotton Mill Superintendent,** wants position. Age 50; married. Sheetings, shirtings, drills, etc.; also all kinds of yarns and yarn dyeing. Has good references. Superintendent eighteen years at one mill.

578 **Cotton Superintendent** with experience as boss carder, master mechanic and superintendent on prints, sheetings, twills and sateens. An American of high character, and whose ability is proved by past record. Age 35, married; can accept position at once.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1269 **Cotton** superintendent, carder, spinner and dresser; 48; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1236 **Supt. of Cotton Mill** desires to change position. Is thoroughly competent, steady and reliable. Good mechanic, manager, push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quantity, quality, and lowest cost. Best system of economy maintained. First-class references can be given.

WOOLEN CARDERS.

1082 **Woolen carder experienced on** all classes of underwear. Has worked for eight years in one mill, 29 years of age and married. Good references.

1190 **Woolen** Carder or Spinner. Age 47; married. One reeler and one piecer in family. Has been overseer and spinner for the last fifteen years for one firm, which is now out of business. Refers to past employers. Can take position at once. Familiar with wool shoddy and cotton; Furbush, Lee and other makes of machinery.

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

1367 **Boss Carder** of wool, shoddy, or cotton. More than 12 years experience as boss carder in leading knitting mills in N. Y. At present employed but desires to change for $3 00 a day or better. Can take charge of mule spinning also. Married; age 36; American.

1286 First-class Carder, now employed, wishes a better position. Has the best of references from good mills. Excellent manager of help. Age 35; married. Experience on broadcloth, dress goods, covert cloth and meltons.

1270 **A 1 Carder,** wool or cotton, 11 years experience, first-class references, reliable, temperate and industrious, desires immediate position. Age 30. Will go any where.

1307 **Carder** with unusually fine record and very wide experience desires good position in New England, Central or Western States. First-class references from past positions. Age 44. Experience on cassimeres, cheviots, dress goods, broad-cloth, repellants and blankets.

COTTON CARDERS.

1403 **Cotton Carder** with 17 years experience in N. E. mills as overseer and second-hand, now in the South but wants to return North. Has never worked for less than $3.00 but would take $2 50 to change. Married. Age 38. Best of references.

1339 **Cotton Carder,** young man holding first-class position in New York State, would like position in Eastern or Middle States as assistant superintendent or boss carder paying $5.00 or more a day. Is worth that salary; experience and references of the best.

1368 **Overseer on Second-Hand Cotton** Carding wants a position in small room at $2.50 per day or upwards. Will do his own grinding. Or, would take a first-class second hand job. Last five years in one place. Thoroughly practical and understands all the machinery in the card room. Age 37; married. Good reference. Prefers New England.

1384 **Second Cotton Carder.** Energetic student at Lowell Textile School wants position in a mill until Oct. 1st 1898. Only expects enough pay to cover living expenses. A bright young man not afraid of hard work.

1315 **Cotton Carder.** Over 20 years' experience as overseer in first class mills. At present employed. Well up on prints and light and heavy sheetings. Knows American and English cards, and speeders. Best references.

WOOLEN SPINNERS.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1287 **Young Man** wants position as boss spinner. Experience in first-class mills on cassimeres, kerseys, cheviots, satinets; knows Davis & Furber, Paul and Johnson & Bassett machines. Age 29. Wife works in mill.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1374 **Overseer Woolen Spinning.** All makes of mules, has had charge in good mills. Experience covers yarns for hosiery, fancy woolens and worsteds. Age 28; married.

633 **Woolen Spinner,** now overseer in good mill, wants to change on account of wife's health to N. E. or Western states. 9 years experience as boss in good mills. Would start for $2.50 a day. Age 37. First-class references.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Plain mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

1316 **Overseer Worsted Drawing** and spinning. Will accept first class position at $3 or more per day. At present employed in well known and first class mill. Age 42. Married. Best references from former employers.

COTTON SPINNERS.

1407 **Cotton Frame Spinner** now in charge of nearly 30,000 spindles in a Southern mill wants to return north. First-class reference both north and south where he has worked. Age 30. Married. American.

1272 **Second Hand** of cotton ring spinning wants position in Massachusetts, Rhode Island, Maine or New York. Age 23; married.

1364 **Cotton Spinner, mules or frames** Early training in England, 5 years in New England mills, yarn 20s to 120s. Because of misfortune would accept second hand job. Excellent reference for character and ability. Age 32, married.

1350 **First-Class Ring Spinning** overseer, also spooling, warping, slashing, web drawing; large experience, highest references as to skill, character and executive ability. At present employed in Fall River. Age 48, American.

1198 **Cotton Spinner,** spooling, warping, slashing, web drawing, skein winding and quilting on linen. Well recommended. Age 42; married. Has worked in some of the best mills. Will go anywhere. Would accept a good second hand's position.

1370 **Overseer Cotton Ring Spinning** At present second hand in a large Maine mill. 13 years experience in spinning Age 34; not married. High references from past and present employers.

WOOLEN WEAVERS.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1099 **Woolen Weaver** with large experience with Crompton & Knowles looms on dress goods, cassimeres, unions, worsteds. Highly reccommended. Age 41. Married

1099 **Woolen Weaver** on dress goods, cassimeres, unions and worsteds. At present out of work because of mill shutting down. Has an excellent record and refers to well-known men. Willing to start on moderate wages. Age 41; married.

1385 **Worsted or Woolen Weaver** of fancy worsted and woolen mens' wear and novelty dress goods. Has held positions in leading N. E. and Phila. mills. Expert on Crompton & Knowles looms: Best references. Age 38; married. Can start at once.

1313 **Woolen Weaver.** First class references, and experience on fancy cassimeres, kerseys, beavers, dress goods, etc. At present not employed, for good reasons. Age 44. Married.

140 **Worsted Weaving Overseer** with 12 years' experience as overseer, designer, and superintendent. Has tried another business for a few months and now wants to go back to the mill. Excellent references, habits all right. A skillful weaver and manager. Age 33, married, American.

COTTON WEAVERS.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married, American. One of the best weavers in New England. Will go South to a good position.

1373 **Overseer Cotton Weaving.** A man with especially good opportunities to gain wide experience in large Mass. mills; now second hand, having worked up from band boy. American, age 29, married; best of references.

1392 **Cotton Weaver,** with first-class record in R. I. mills, desires to change for position paying $2.50 or more. Experienced on sheetings, lawns, sateens, twills, etc. Excellent references. Age 35, married.

1353 **Overseer Cotton Weaving,** who has worked up from fixer to overseer in good mills, wants position paying $3.00 or more. Scotch, age 29; experience on all kinds sheetings and sateens.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

1409 **Cotton Weaver.** An exceptionally good man on prints, light and heavy sheetings. His mill has shut down and he desires to move to South. Very highly recommended. Age 40. Married. American.

DYERS.

1354 **Dyer of Large Experience** both in woolen mills and in job dyehouses. A man of far more than average skill from raw stock to piece dyeing, dress goods, etc. Scotch, married; age 39.

1355 **Wool and worsted Dyer,** a young man with 5 years' training by one of the best dyers at one of the largest mills in N. E. Experience on worsted and woolen cheviots, clays, worsteds, suitings, cloakings, beavers, dress goods, carriage cloths, yarn, slubbing, wool. Would be able to take charge of small high grade small plant.

919 **Knit Goods Dyer,** 18 years experience, especially on underwear in first-class N. Y. mills. Would be fully capable of taking full charge of mill. American. Age 42. Married.

1361 **Wool Dyer and Finisher,** large experience on blankets, all kinds of flannels, felts and dress goods Early training in Scotland, 15 years in this country. Now employed, but wants to locate in the North near the sea. Age 40, married; now giving entire satisfaction.

1382 **Cotton Piece Dyer.** 12 years at last place. Experienced in all kinds of cotton goods. Englishman, age 37, married. Well recommended for character and ability.

1393 **Knit Goods Dyer** who has had 18 yrs. experience in first-class mills, desires to make a change. Is capable of taking the management of a cotton underwear mill. Best of references. Age 42; married, American.

1377 **Woolen Dyer** with experience on a great variety of goods, including raw wool, yarns, carriage cloth, satinets, kerseys, beavers, repellents, men's suitings; well recommended. Would start at $2.50 a day. Age 32; married.

FINISHERS.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married.

1359 **Woolen Finisher** of all kinds of woolen goods; 20 years in charge, at three leading mills. At present out of employment; expects $4.00 a day. Age 45, married; references first class.

1330 **Expert Finisher** with 10 years' experience in European mills. Can do perfect work on highest grade cassimeres, serges, cheviots, kerseys, worsteds, astrachans. Age 34; married. German, speaks English imperfectly.

1376 **Finisher** of all grades of woolens and worsteds, wet or dry. 8 years experience in England and 6 years in this country. Now employed as overseer but wants to change location. Age 30; married.

1396 **Wool Finisher.** This man has had a very large experience among well-known mills and refers to past employers. Character and ability of the first order.

1400 **Underwear Finisher** or Assistant Superintendent. Has worked up from brusher boy to assistant superintendent in first class N. Y. mill. Experience covers flat and ribbed goods. D. & F. cards and jacks. Union Special, Singer and Wilcox & Gibbs Sewing machines. American. Age 26. An energetic, smart young man.

KNITTERS.

1402 **Circular Rib Knitter** now holding position as overseer in N. Y. mill would like to secure better position. Has worked on spring needle and welt work silks, worsteds, cotton, tuck stitch ladies' forms. Can refer to present and past employers. Age 24. American.

1401 **Boss Knitter** at present employed but wants to change. Experience on plush, cotton, and wool. 10 years as second hand previous to present position as overseer. Age 30. Married.

1405 **Boss Knitter.** Young man with good knowledge of knit goods. A1 on circular ribbers. Thoroughly experienced on mittens, leggings and golf hose. owns 3 machines. Can bring best of references from large concerns. Desires position with good house.

1410 **Knitting Machine Fixer.** Young man who wants to gain large experience in this line desires a position in the Eastern or Central states. Is expert on many kinds of machines. Leggings, bicycle hose, gloves, mittens, etc. Highly recommended as to character and ability.

1362 **Boss Rib Knitter**, young man, now second hand in fleece lined underwear mill in New York State wants to advance. Very highly spoken of by present employers as to both ability and character. Could change on short notice.

1342 **Hosiery or Underwear Supt.** A practical knitter familiar with latch, spring needle, and sewing machines; nearly 15 years superintendent of New England hosiery mill, at present shut down. Good manager; references first-class. Age 47; married.

1391 **Boss Knitter** who has the very best references. Now employed but wants more pay. Would change for $3.50 a day. Experienced in both hosiery and underwear. Age 32; married, American.

1371 **Cotton Hosiery Supt.** Has had charge of hosiery mill in N. C. Would like a western mill. Refers to last position. Young man, not married.

DESIGNERS.

1411 **Assistant Supt. or Designer** desires position. Thoroughly practical, having had experience from picker to loom in one of the best N. E. mills. Has designed both single and double cloths in cotton, woolen, worsted and silk. Good references.

1259 **Woolen Designer or Supt.**, 10 years' experience on meltons, kerseys, beavers, and dress goods. Thorough knowledge of color mixing and picking out. Best of references from past positions. Age 39, single.

1397 **Cotton Designer or Weaver.** A young man with unusual opportunities and experience in England, now holding a position in a leading mill in Connecticut, desires to advance. Refers to several prominent mill men and would make a progressive designer for a mill running on Jacquards, Lappet or Lenos.

1383 **English Woolen Designer.** 20 years in leading Yorkshire and Huddersfield mills as designer, supt. and weaver. Very large experience and would accept moderate salary in good mill. Age 36; married, English.

9999 **Superintendent Print Works.** Young man, 30 years of age, energetic and practical, graduate chemist, with thorough experience in printing, especially of silk (2 years in Europe and 4 in this country), seeks position as superintendent or assistant in print works. Address Chemist, care TEXTILE WORLD.

MISCELLANEOUS.

1365 **Assistant Supt. Underwear Mill.**—Experience mostly on flat goods, is an expert bookkeeper, understands making cheap goods, finishing, and general knowledge of machinery. Moderate salary. Age 39, married, American.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1393 **Practical Chemist.** Experience covers three years in English and German textile schools and 17 years in New England mills, bleacheries and print works. Has practical knowledge of all departments of a bleachery, and would accept position in the South. Age 39; married; American.

1381 **Cloth Examiner.** Worsteds or woolens. German, age 50, single. Man of high character, 9 years in one of the leading N. E. mills and also in large N. Y. clothing houses. Best of references.

1395 **Overseer of Slashing, Spooling**, warping and dressing, a man who thoroughly understands his business and has excellent habits, well recommended from leading mills. Age 42; married, English.

1379 **Overseer, Cloth Room.** Out of work because of change in management. A man with first-class record and wide experience. Refers to several prominent mill men. Age 39; married, American.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1372 **Wool Sorter.** Young man with excellent training in R. I. mill. Will start at $2.00 a day. Refers to past employers.

1312 **Overseer Dresser.** Age 34. Married. Is at present working in a first class mill. Desires to change because of poor health of family. Can furnish first class references. Cassimeres, unions, woolens.

1363 **Twisting, Spooling, Warping** overseer. Experience on single and twisted yarns up to 2/100s in one of the best New England mills. Now employed as assistant; young man, but is confident that he could satisfactorily fill overseer position.

1356 **Second Hand Cotton Spooling**, warping, twisting, slashing, or could handle overseer position in small mill. Well recommended, now with good mill.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

1399 **Master Mechanic** with experience from bench work up to foreman. Has worked in cotton mill and cotton machinery works. First-class workman. Can get the best results from power plant and machinery.

1404 **Chief Engineer.** A man who is fitted by education and experience to take charge of a large plant. Has had charge of erection of steam, water and electrical plants, pumping machinery and cotton mill equipment. Would be an excellent man to superintend the erection of a new plant and economical operation of same.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Plain Series of Cotton Spinning Calculations, by William H. Cook, 91 pages.

This book gives original calculations relating to cotton spinning, giving the position of the different pulleys and wheels, which are taken into consideration when making calculations; and also points where the necessary changes are made when altering from one count to another. Price $1.

The Student's Hand-Book of Practical Fabric Structure. by H. Neville. 8vo., 235 pages.

The object of this work is to interest the student in the subject of weaving by a series of consecutive lessons in the principles of fabric structure. Free use is made of sectional diagrams, to show what actually takes place in producing any particular fabric. An idea may be had of the nature of the book from the following partial enumeration of the subjects treated: Design Paper and Its Uses; Plain Cloth and Its Ornamentation, Twilling, Drafts and Tie-ups; Spotting; Open-work Effects; Cords; Pile Weaving; Cross Weaving; and Backed and Double Cloth. Price $2.25.

The Printing of Textile Fabrics, by C. F Seymour Rothwell. 8vo., 312 pages.

This is a practical manual on the printing of cotton, wool, silk, and half-silk fabrics, with plates, illustrations in the text, and specimens of printed fabrics. The work contains but little information of a purely chemical or theoretical character, as it has been covered by the "Manual of Dyeing," by Knecht, and others. The author has confined himself more to the practical side of the subject, and the processes and machinery described by him are principally those with which he has had practical experience. Price $6.50.

Cotton Spinning, by W. S. Taggart.

Two volumes of this work have been issued; the second volume brings cotton spinning down to the end of what is generally termed the preparing processes and includes all of the machinery and manipulations between the card and the self-actor, or ring frame. This work is esteemed of much assistance to the student. Price $1.75.

Ornamental Design for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

The Power Loom, by Alexander Brown.

This is a practical, well written treatise of 118 pages, on the construction of the power loom and the art of weaving, giving descriptions of the texture produced by different numbers of harnesses. The text is illustrated with diagrams, and contains calculations and instructions for the production of cotton, woolen, linen and jute fabrics. It was written with the intention of serving as a text book for those engaged in the trade. Notwithstanding it relates to English machinery, it is of value to those operating that of American make. Price $1.25.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 362 pages. Price $1.75.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $2.50.

Technology of Textile Design, by E. A. Posselt.

As a practical treatise on the construction and application of weaves, and the analysis of cloth, this is, in very many respects, the best work for the American manufacturer that is published. Price $5.00.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

Patents.

Concluded from page 20.

Loom. 606,553. George F. Hutchins, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, same place.

Loom. 607,360. Aloysius J. Gillet and George Rutter, Fall River, Mass.

Looms. Batten, Shuttle-block and shuttle for. 607,486. Otto W. Schaum, Philadelphia, Pa.

Looms. Electric Stop-Motion for. 607,714. Alejandro Stephens, Guadalajara, Mexico.

Loom Shuttles. Supporting Mechanism for. 607,087. Mathew Saile, Philadelphia, Pa., assignor of one-half to Spencer D. Wright, same place.

Loom Temple. 607,377. George F. Hutchins, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, same place.

Quilling Machines. Spindle for. 606,890. Frederick Kesselring, Sterling, N. J.

Spinning Machines. Adjustable roll frame for. 607,635. Frederick S. Culver, Taunton, Mass.

Spinning Rings. Method of and apparatus for truing. 606,675. Frank M. Marcy, Worcester, Mass., assignor to the Draper Co., Hopedale, Mass.

Textile Fabrics. Apparatus for applying liquids to. 606,454. Ferdinand Girard, Paris, France.

Tentering Machine. 606,780. Charles J. Gadd, Philadelphia, Pa., assignor to the H. W. Butterworth & Sons' Co., of Pennsylvania.

Yarn. Machine for Mercerizing. 607,150. Charles L. Weichelt, William S. Grady, and Arthur Jones, Philadelphia, Pa.

Facts and Gossip.

—New Jersey, Rockaway. The Lion-dale Bleach & Dye Works are busily engaged on a large government contract for dyeing and finishing the tan duck, which is being used for soldiers' uniforms. They are finishing from 8,000 to 10,000 yards per day and are running their works until ten o'clock. It is expected that the contract will take the entire summer to complete. It is eight ounce duck.

—*New York, Dryden. The woolen mill of Hugo Dolge, at the recent assignee sale, was bought by New York parties and it is understood that it will be operated by Mr. Dolge, as heretofore.

—New York, Greenwich. The property of the Pleasantvale Knitting Mills was sold June 28th by Harry C. Gray, assignee. The real estate was bought by the Schuylerville & Greenwich banks jointly for $16,800, and the machinery for $6,287. This price is slightly above the mortgage. The bank bought to protect their interests and there is no prospect of mills being started.

—New York, Little Falls. A portion of the machinery and stock of the Saxony Mills was sold at auction by the sheriff on July 22, to satisfy a judgment secured by A. M. Mills.

—New York, Poughkeepsie. It is reported that A. V. Rockwell, silk throwster, who moved to Mattaewan, will move back to Poughkeepsie. The machinery in the silk mill in the upper part of the town is being moved out.

—New York, New York. A new corporation is the D. P. Winne Co. to manufacture twines, yarns, cordage, and threads. Capital, $20,000. Directors, David P. Winne, 28 Lenox Road, M. T. McGrane, Joseph M. McGrane, F. V. Sinclair of Brooklyn, and James F. Hinde of New York.

—New York, Oriskany Falls. The Columbia Yarn Mill, operated by H. Langley, was sold at auction on July 16, to N. S. Tompkins, for $2500. It is a two-set woolen yarn mill.

—New York, Sherbourne. The Ross print cloth mill containing 8500 spindles and 174 looms was sold at foreclosure sale last week and bought in by the First National Bank of Utica and the Sherbourne National Bank for $5,000. It has not been run for some time.

—New York, Troy. The assignee of Stephen W. Barker and the Schaghticoke Woolen Co., has filed his inventory which shows a surplus of about $250,000 in the combined properties. The Schaghticoke inventory shows about $250,000 assets and liabilities $475,000.

—*North Carolina, Balfour. In April we reported that the Balfour Manufacturing Co. had been organized and were to establish a knitting mill. We are now informed that the erection of this plant has been postponed for the present.

—Ohio, Roscoe. The Roscoe Woolen Mills have been leased by Alonzo Clark and J. J. Lenhart. W. H. Wilson has charge of the mill and it will be started up at once.

—Ontario, Kingston. Negotiations are under way between the Corporation of the City and the Dominion Cotton Mill Company, whereby the latter is to get a bonus of $25,000 and exemption from certain taxes, on condition they increase the capacity of the mill to 500 looms and add the necessary carding, spinning and other machinery to balance the plant. Furthermore, all the machinery is to be remodeled and the plant brought up to date and operated to its full capacity. The improvements must amount to $125,000, of which not less than $25,000 shall be expended on the buildings.

—Pennsylvania, Chester. J William Lewis & Co., gingham manufacturers, are using all their spinning for filling yarn and now purchasing their warps out side.

—Pennsylvania, Coudersport. The firm of E. J. Marble & Sons has been incorporated under the laws of West Virginia, by the name of the Northern Woolen Manufacturing Co.

—Pennsylvania, Shamokin. The firm of Kline & Ressler has been dissolved. S. L. Ressler having purchased the entire interest of his partner and together with T. V. Hertzog will continue to operate the Shamokin Valley Knitting Mills under the name of Ressler & Co.

GUSTAVE P. FRESNEL,

Agent for the Best Designers in LYONS and PARIS.

Latest French novelties in sketches for Printed Cotton Goods, Printed Silk, Broad Silks and all kinds of textile fabrics.

125 West 56th St., New York.

Wanted.

Weaver Foreman in Matting and Bagging Factory. Must be experienced, good habits, and reliable, and about 30 years of age. State qualifications and wages expected. Address WISCONSIN GRASS TWINE CO., Oshkosh, Wis.

Do You Want More Trade in N. Y.?

Wanted, agency for Woolen or Cotton Mill. Have good Salesmen and best trade. Have ample facilities to carry stock for own account if necessary. Can furnish A1 references. Address

WESTERN TRADING CO., Incorp.,
423 Broome St., New York.

Fibre Ware Machinery.

For sale, a complete set of presses, machinery and tools for the manufacture of fibre ware, such as buckets, pails, jars, etc. Will sell cheap. Address.

STANDARD FIBRE WARE WORKS,
Mankato, Minn.

Facts and Gossip.

—Pennsylvania, Craigsville. The woolen mill of Ross, Burford & Co. has received a large contract for blankets from the govenment.

—South Carolina, Chester. The Catawba Mill's property, which has been bought by a number of Philadelphia capitalists, as recently mentioned, has now been incorporated under the name of the Eureka Cotton Mills. Capital stock, $60,000.

—South Carolina, Columbia. A number of mortgages on the Elmwood Cotton Mills are in process of foreclosure and it seems improbable that the plant will ever start up, at least under the present management. This is the mill which was to be run by colored operatives.

—Texas, Galveston. A meeting of the bondholders of the Galveston Cotton Mills has been held to perfect a re-organization. Property has been ordered sold by the court and the bondholders expect to bid it in.

—Massachusetts, Blackstone. Charles Fletcher's Woolen Mill at this place is now equipped with 174 new broad looms from the Crompton & Knowles Works.

—Massachusetts, Chapinsville. H. Prescott Brigham, of Worcester, informs us that he is not yet able to say anything definite about his leasing part of the Chapinville Mills. It had been his idea to start up in these mills in the early fall, but other inducements may cause him to seek some other location.

—New York, Binghamton. The sale of the personal property of the Binghamton Woolen Co., including machinery, has been postponed to Aug. 30.

EDWARD JEFFERSON & BRO.,

Worsted .·. Machinery,

28 Strawberry Street,

PHILADELPHIA, - - PA.

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J. B. Farrar & Sons, Halifax, England,

Buggelia Cork Rollers for Spinning and Drawing.

MACHINERY Shafting, Hangers, Pulleys and Couplings. Machinery Steel in all sizes from 6 1-2 inches diameter down to 3-16 inch diameter, cut any length, always in stock. Cold Rolled Rounds, Squares, Flats, Hexagons, Octagons, Decagons, and all shapes finished to exact sizes. Everything in readiness to be shipped at once. Our goods are without a rival and our prices the lowest of all.

Telephone 314, South Boston.

COMPRESSED STEEL SHAFTING WORKS,
South Boston, Mass.

Expert German Finisher Wanted.

A man who is thoroughly acquainted with German finishing machinery and German finishing methods. Prefer one with a thorough knowledge of machinery. One who can operate as well as design and furnish information. Address in confidence,

G. F. care of Textile World.

NEW PATTERNS

of all kinds of textile novelties (**French, English and German**) supplied by Season's Subscription at moderate rates, or in single parcels of 100—300 new patterns assorted as required, for **$10 per parcel.** Address full particulars as to styles wanted to

A. SMITH, 89 Rue Turenne,

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Hosiery Mill For Sale or To Let!

A new plant, capacity 100 dozen per day.

Water Power To Let, 400 H. P., with excellent buildings.

W. K. DANA, Westbrook, Maine.

Rib Knitter.

Competent, reliable man of experience on rib and other flat knitting machines, desires position. References. Addre s, "H," 231 Lawrence St., Hartford, Conn.

Foreman Wanted

To correspond with a man to act as foreman in shop in South Carolina making Picker Sticks, Spools and Bobbins. Address,

F. W. H., care Textile World.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

WHERE? HOW? WHY? WHO?

Where can we get such a machine?

How can we produce that effect, or color, or fabric?

Why does this machine run badly, and what can I do to fix it?

Who makes such and such fabrics?

• • • •

Such questions and scores of similar ones are constantly arising, and our Questions and Answers Department undertakes to answer those relating to textile matters, free of any charge, to the best of its ability, and invites such correspondence from subscribers. Address the Boston office.

TEXTILE WORLD,
620 Atlantic Avenue, Boston.

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn: After a good run, the spinners are doing but little and the trust has found it necessary to reduce the price of yarn one cent per pound. The knitters are doing fairly well in some instances, but buyers are holding off from buying, hoping for lower prices. Much 2-ply yarn in 2/30s to 2/40s have been sold woolen manufacturers, but the poor success with goods produced with cotton yarn in such large quantities is causing a curtailment of demands for such fabrics. Already some of the better knitters are placing orders for next season's light weight yarn because the actions of the trust are uncertain. Spinners, however, prefer to wait to see how much they must pay for raw material and will then be ready to talk price. The latest report indicates a further rise in full rough Peruvian cotton. The cause of this is a scarcity of rain at place of growth. It is claimed that the present year is the driest since 1891, not having permitted the planting of a single plant of cotton. The next crop will be extremely reduced. With Egyptian cotton, stocks are much reduced and spinners will cover for requirement before accepting orders for yarn. It is noted that the best combed yarn has at last been considered the cheapest, as goods made with this class of yarn gives the greatest satisfaction and are bought in preference to those made from half combed yarn after buyers have tried them. The fleece lined garments are still in good demand, although the prices secured for them are low indeed. Fine yarn is used in 1/30s to 1/24s blue mix and other colors on the face, and 1/5s to 1/8s on the back. Jauger and Silver Gray are in demand for men's ribbed garments. Silver gray is being used almost entirely for ladies' ribbed goods. Union suits are being sold well in the West and orders are placed extensively for carded Egyptian, in 1/10s and 1/11s.

Woolen Yarn: Spinners are getting but few orders. The trade in this respect is at a standstill. Orders placed early in the season may be delivered later, but chances are against it, now that the light weight season is about to open. The hosiery trade is doing better but most of the orders placed are for shoddy goods. This, however, will undoubtedly be changed as the season advances, when, we believe, that a good business will result as no wool hosiery can be imported, and the stocks which we imported previous to the enactment of the tariff are much reduced. Two-ply yarn is in demand at prices which are lower than any one cares to manufacture. Later in the season a good demand will be for this yarn with the spinning mills. Some orders are being delivered for backing of heavy weights, but this demand will soon be over. The wool merchants who sold their wool before January 1st are to be congratulated. On paper, and in fact, wool has advanced, but it costs 2 to 3 cents per pound per year, and the advance is only the adding of the necessary interest, and if prices range the same or less than during January 1st, the owners are the losers, but many of the dealers own high priced wool purchased during the boom. The conclusion we reach is that the wool dealers are not happy and manufacturers who expect to find low wool later on will get left.

The foreign wool market continues to advance. The last sales opened with 265,000 bales to offer and the series closed July 21. The final figures now place the deficiency of last year's Australian clip, as compared with the previous season, at 125,000 bales against early estimates of a

(Continued on page 131.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

WESTFIELD, MASS.

HOSIERY AND SEAMING YARNS.

Also Polished Threads.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double and Twist,

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

YARNS

SOLIS : : BOSTON.

179 Devonshire Street.

ANDREW J. SOLIS, Jr. & CO.

(Continued from page 129.)

shortage of 180,000 bales. Viewed from the standpoint of supply, the position is hardly as strong as it appeared earlier in the year, however, stocks are admitted small and the advance which has been brought about as the sales have proceeded is what was to be expected.

A sharp rise in the value of turkey mohair, from 15d to 19d per pound, would seem to point to a demand for bright fabrics The next series will open on September 20th. From California our reports show that while the market has ruled quiet, some choice wools suitable for immediate shipment have changed hands, and the outlook is good for a fair business at good prices. We read with much amusement the articles of Judge Lawrence calling for higher duties on wool, because wool has not yet reached the importing point, and cotton has displaced wool to a greater extent this season than ever before. It all goes to prove the folly of an excessive duty on wool. Spinners are anxious for business and are working with prices which are more nearly to cost than at any time during the bad times. We confidently look for better times and spinners will then have more business than they can attend to.

Worsted Yarn: Spinners are not getting orders to any extent. Some orders have been placed for serges and dress goods in 2/36s and 2/40s. We hear of 2/36s, one-half blood, as being sold for 65cts. Fancy worsteds are not selling well. The present and coming season is pre-eminately one for piece dyes. The fancy worsteds are not in it. The reason for this is that the buyers do not know how much of a season they are going to have, and if any goods are left over, if made up from piece dyes, they can be used another time, whereas if fancies are purchased, there might be seen a change in style, and if a bad season is ahead, a loss would result from carrying over goods. The cancellations during the past season have

(Continued on page 133.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelphia, Pa.
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Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Mercerized Cotton Yarn in two or more ply. Gives a permanent lustre equal to spun silk.

Novelty Yarns, Mohair Loops, Cotton Flake and Nub Yarns.

High Grade Cotton Warps, in colors, on beams, in chain warps or in skeins, single or two-ply.

Printers of Cotton, Wool, Worsted or Silk Yarns.

Cotton Warps. WHITTIER COTTON MILLS, LOWELL, MASS.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

INDIAN ORCHARD CO.,

Indian Orchard, Mass.

MANUFACTURERS OF

Lustred Cotton Yarns.

In Various Colors and Twists.

NOVELTY YARNS

In Cotton, Silk and Worsted, in various patterns and colors.

Cotton Warps and Yarns

In Gray and all colors, single or 2, 3, 4 and 6 ply, and Cable Cord.

COLORED COTTON

Machined, Carded or in Roving.

(Continued from page 131.)

been enormous, in some instances 50 per cent. of the orders placed were cancelled. The mills which submitted quietly to these demands have fared the worst. Those requiring a fulfilment of contracts, in many instances saved their orders. It is the opinion of cloth salesmen that cotton-worsted goods will not be used in great quantities this coming season. During the heavy weight season, buyers were obliged to purchase this class of stock in an endeavor to give customers cloth at old prices. Those whose trade always called for cheap cloth have had no trouble, but the clothiers, who have hitherto purchased honest cloth, have had much trouble from customers and will buy no more at any price. It is this phase of the situation which makes an uncertainty in the market. It is the opinion of those who should know, that the only safe purchase is a cotton-worsted, about all cotton and very little worsted. Cloth with 50 per cent. worsted is a bad cloth to handle, because those buying better grades have enough of cotton-worsteds, and those handling the cheaper qualities want all cotton. Heavy weight orders, for piece dyes, honest cloth have been placed quite extensively during the last four weeks and the cloth is not being delivered fast enough. This does not mean that mills are in the market for yarn. Manufacturers at present, we find, are using stocks purchased in many instances before the new law went into effect. Some of the larger manufacturers are stopped because they are running on unpopular styles. The finest fancy worsted cloth is selling very poorly, as the advance is felt most in this class of material, and yarn manufacturers are opening their light weight samples 5 per cent. lower that the highest point reached last year in order to move; the cloth mills claim that they can come out about whole on this, but no money in it. They say that they would rather do this than shut down, as a mill when

(Continued on page 135.)

Colchester Mills,
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
Mule Spun Cotton
Hosiery Yarns.
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F. Patterson, F. E. Snow Receivers Colchester Mills.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
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WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
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A. HERBST. J. W. JONES.
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WORSTED YARN SPINNERS,
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ALBERT R. ELSASSER,
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A SPECIALTY.
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MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
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EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns (Simile).

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
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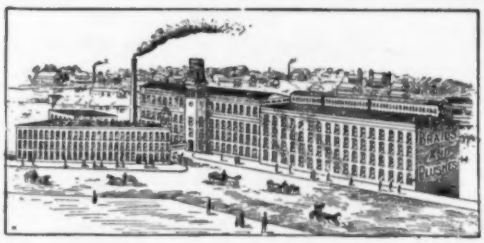
HADLEY
SPOOL COTTON AND FINE YARNS
COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 plv cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.



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Mohair Plushes,
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Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & Co, Philadelphia and Boston.

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Manufacturers of Spool Cotton & Supofine Tapes
Thread and Yarn on Tubes and Cones for the Hosiery trade etc. Thread dressing a specialty, for weaving purposes. Dyers and Bleachers of Threads, Yarns and Tapes.

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COTTON, YARNS WORSTED,
WOOLEN, AND SPUN SILK.
BRAIDS
PROVIDENCE, R. I.

BURNET & CO.,
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All numbers and qualities of Cotton Yarns, specialties in
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B. F. BOYER & CO.,
Successors to GEORGE SHIMER & BOYER,
HOSIERY YARNS,
In Wool, Merino and Worsted.
GOLF YARNS,
In Wool and Worsted. Also carry a full line
BUNDLE YARNS
For the Jobbing Trade.
MILLS AND OFFICE AT
CAMDEN, - - N. J.

A copy of the Textile World's Directory is presented to every paip-up subscriber of the Textile World, with the compliments of the publishers.

Continued from page 133.

once disorganized in its regime, is difficult to get into order again. Washington mills are opening clays at a lower price than last year for immediate delivery, but this is said to be cloth that was made up and cancelled last season and is in stock. The yarn market has been treated to somewhat of a sensation the last week or so. Wisconsin reported that some 800,000 to 1,000,000 pounds of 2/40s Australian yarn has been purchased on speculation, divided among three or four mills. This we believe should be taken with several "grains of salt" and if it is true and the prices paid range, as reported, 92 to 95 cents per pound, the syndicate have been stuck at the start, and the sellers have made 22 cents per pound on all yarn sold, or a profit on one million pounds of yarn of $220,000 because this yarn was made with free wool, and under free wool this class of yarn was sold in the neighborhood of 70 cents per pound. This yarn can be purchased today at from 82½ to 85 cents. But if we allow this to be true, that 92 cents was paid, the spinners made 22 cents per pound or $220,000 profit. The syndicate expect to sell this yarn for $1.12½ per pound.

Yarn cannot be imported at less than $1.12½ to $1.15 per pound. If the syndicate sells at this price they will make 20 cents per pound or on 1,000,000 pounds, $200,000. Thus we see that due to an exorbitant tariff, a profit of 42 cents per pound is made on yarn which is sold in Europe under free wool for 50 cents per pound and which sold in this country before the duty on wool, for 70 cents per pound. Spinners are working hard for orders, but although many of the mills are running, no orders are being placed, as all are working up stock and yarn purchased before the advance. We believe that next fall's business will be very good indeed and that spinners will have more business than they can attend to. Where mills own stock, lower prices are made than in cases where mills must purchase on the market.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

O. H. HAYES & CO.
Will make liberal arrangements with Woolen Manufacturers to handle their productions.
O. H. HAYES & CO.

The Philadelphia Yarn Market.

There is nothing new to report in the cotton market, except continued weakness in prices. Under considerable pressure to sell, with business considerably curtailed, there has been a steady demand through the month, but not a large one. Prices have been cut down to as low a point, in many instances, as they have ever reached.

The upholstery and carpet trade are still dull but more active than a month ago. Deliveries on old orders have been fairly well taken.

Worsted and woolen yarns are still in an undesirable condition. Spinners have been glad to sell to the extent of any holdings of cheap wool, and at prices they would not take into account for new purchase of stock. We quote cotton yarns:

WARPS.

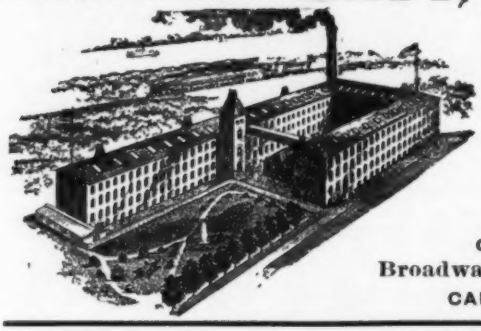
20/1	12¾ to 12¼
22/1	12½ to 13
26/1	13½
12/2	13
14/2	13
16/2	13½
14/1	11¾ to 12
16s	12
20/2	14
30/2	16½ to 17
30/2 Eastern	17½ to 18
40/2	23 to 24

SKEIN.

26/1	13
20/1	12¼
19/1	12½
4s to 10s soft	11½ to 12

(Continued on page 137.)

HOWLAND CROFT, SONS & CO.



LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns for Braids, etc.

BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

(Continued from page 135.)

12/1 soft	12
20/2 medium	13½
14/2	12½ to 13
30/2	16
26/2	15½ to 16
40/2	22½ to 23
8/3	10½ to 10¾
10s double reeled	11
16/3	12½ to 13
16/4 medium	12½ to 13
16/2 slack	12½ to 13
9/4 slack	10½ to 11

SOUTHERN CONES.

6s to 8s, various qual.	12 to 12½
10s " "	12½ to 13
12s " "	13 to 14
14s " "	13½ to 14½
16s " "	14 to 15
20s " "	15 to 16
24s " "	16 to 17
26s " "	16 to 17

SHUTTLE COPS.

6s to 8s	12 to 12½
12s	12½
16s	13
26s	13½
40s	18 to 19

MIXED COLORED CONES.

6s to 8s	13½
10s	13½ to 14
12s	14 to 15
14s	15
16s	15½ to 16

EASTERN COPS.

12s shuttle	13 to 13½
14s	13½
16s	13½ to 14
12s hosiery	14
14s	14 to 14½
16s	14½ to 15
20s	16
24s	16½

Eastern skein ½c. above cops.

Eastern cones ½ to 1 ¾c. above cops.

Egyptian, carded, 4 to 5c. above white.

Combed yarn, 4 to 5c. above carded.

—In all cotton manufacturing fancy woven goods, it is necessary to produce new designs if the mill is to be up to date. Much of the designing is done on paper, but paper work is not always satisfactory, as often a design which looks well on paper appears just the opposite on the cloth. This may perhaps be due to the use of unsuitable yarns in producing the design, for the difference between using a fine or coarse yarn makes, as every manufacturer knows, a great deal of difference in the appearance of the finished fabric.

—Spinning wheels differ in form and size, according to the kind of spinning for which they are designed. The present generation of women are not such connoisseurs in spinning wheels as were their mothers.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

THE PHOENIX MILLS CO.,
MANUFACTURERS OF
Fine Worsted Yarns.
Correspondence Solicited. Samples furnished on application.
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MILLS: 10th & Germantown Ave., Phila. Chester, Pa.
PHILA. OFFICE. No. 13 LETITIA ST.

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Spinners of Worsted Yarn for the Weaving and Knitting Trade.
All kinds of Fancy Yarns for the Knitting Trade.
5th and Erie Sts., Camden, N. J.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.

79 Chauncy Street, BOSTON.

186 Franklin Street, CHICAGO.

WILLIAM RYLE & CO.,

DEALERS IN

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Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

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MANAYUNK, PA.

DYERS of Cotton, Cotton Yarns, Wool and Raw Stock Generally. **BLEACHERS** of Cotton and Cotton Yarn.

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New York Office, Silk Exchange, Broadway and Broome St.
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

Boston Finishing Works

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FRANKFORD, - PHILADELPHIA.

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PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

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" BB "		" Brown, BB.	
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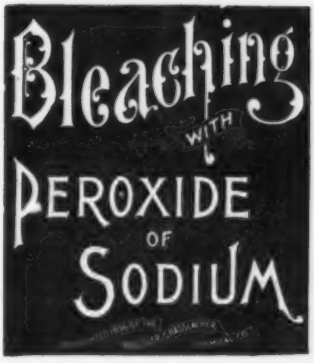

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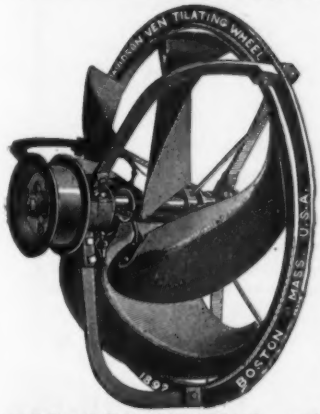

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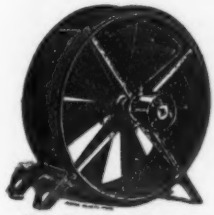

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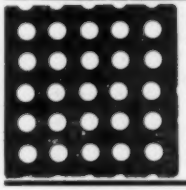

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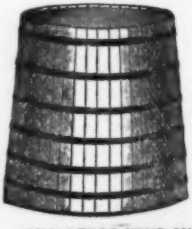

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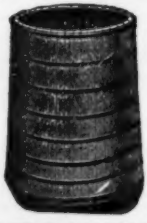

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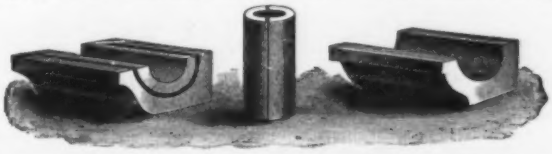

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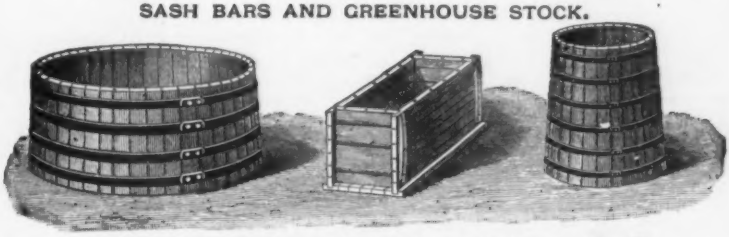

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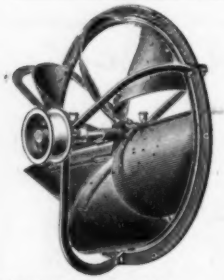

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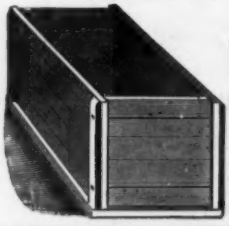

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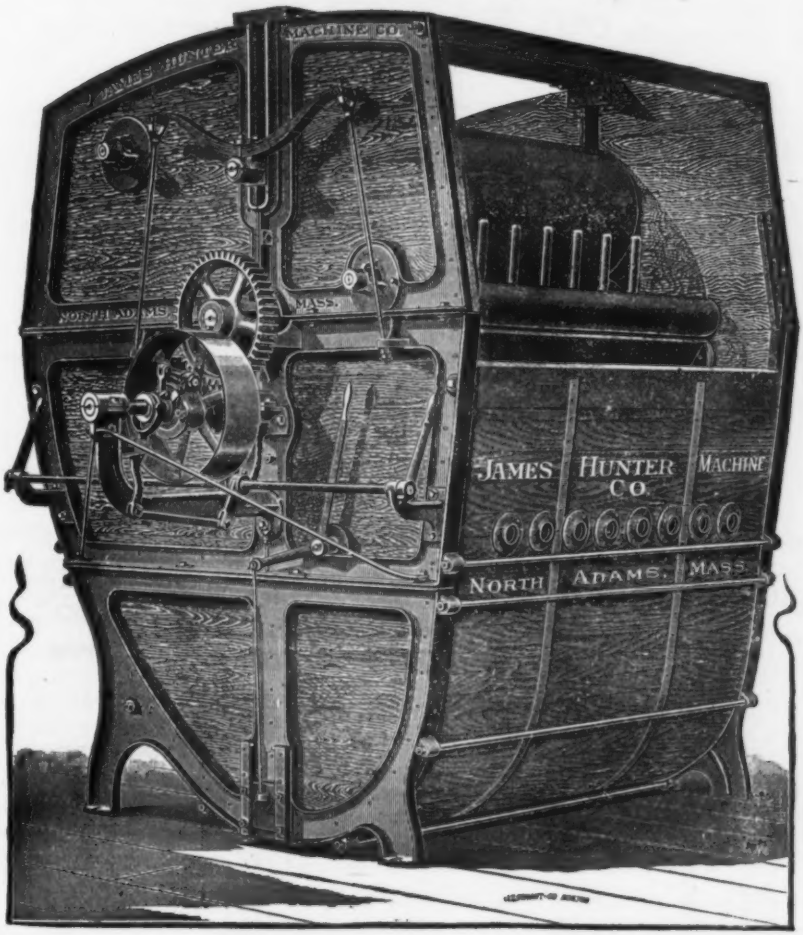

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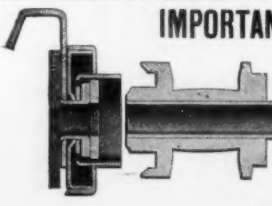

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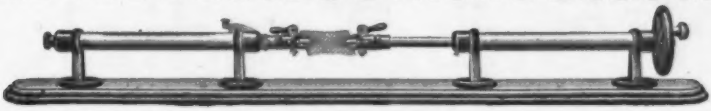

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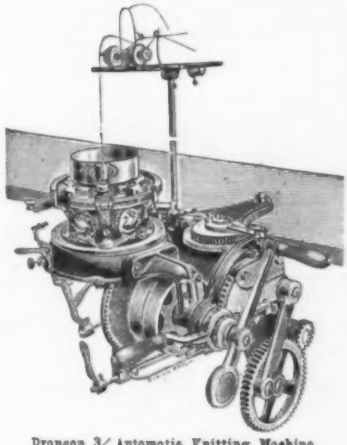

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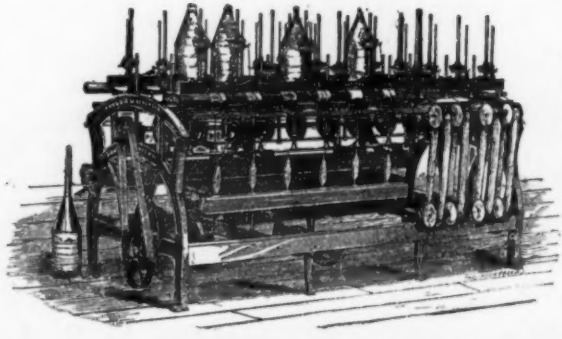

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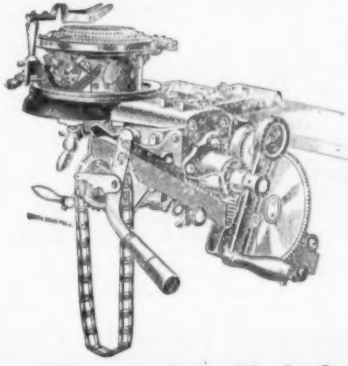

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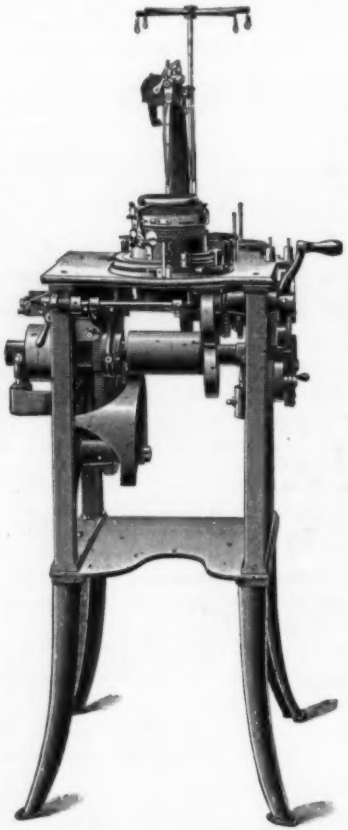

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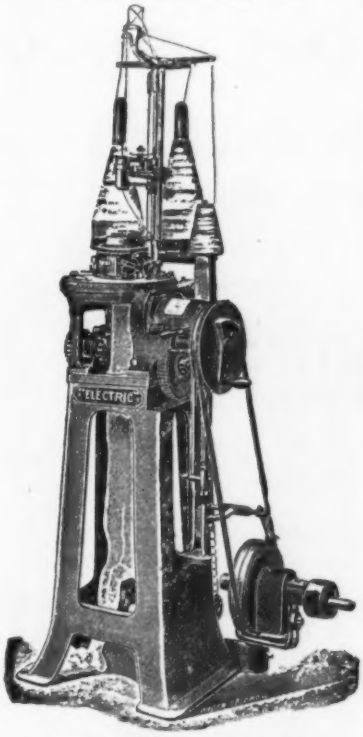

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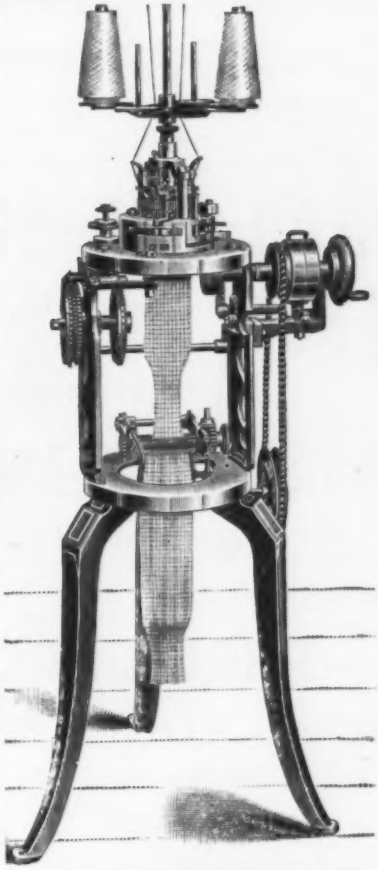

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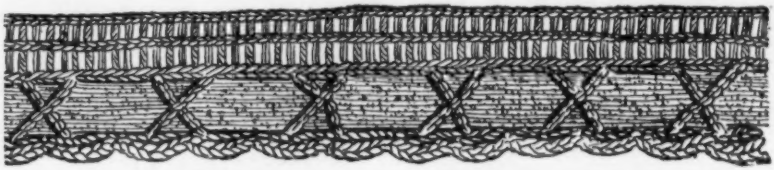

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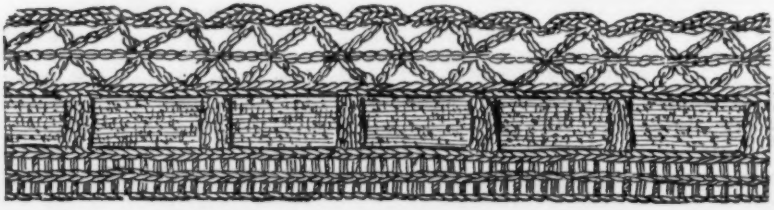

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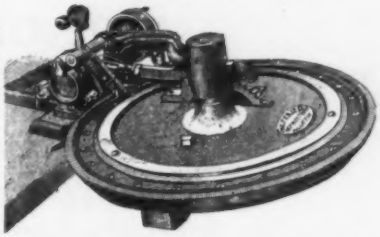

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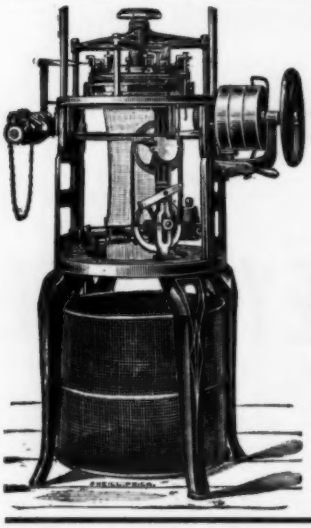

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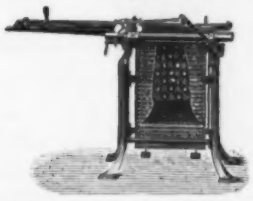

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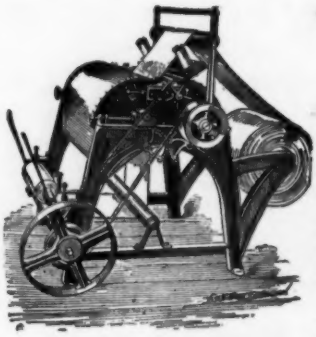

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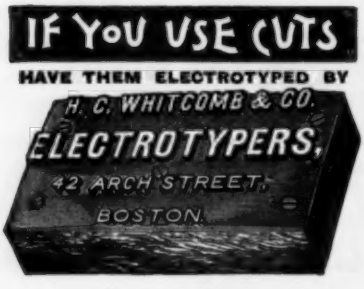

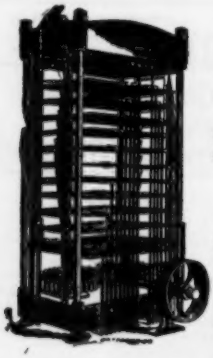

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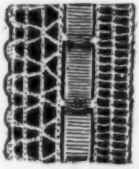

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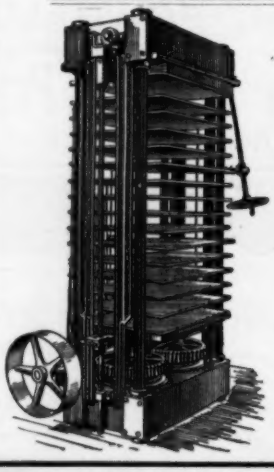

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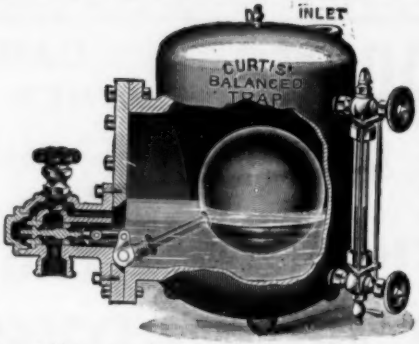

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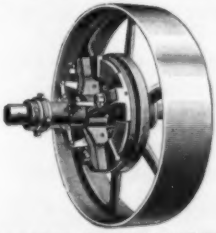

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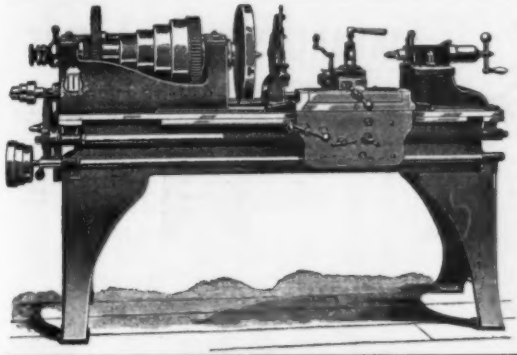

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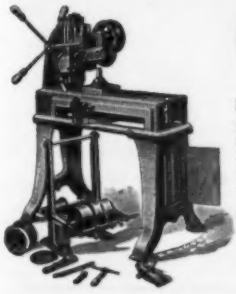

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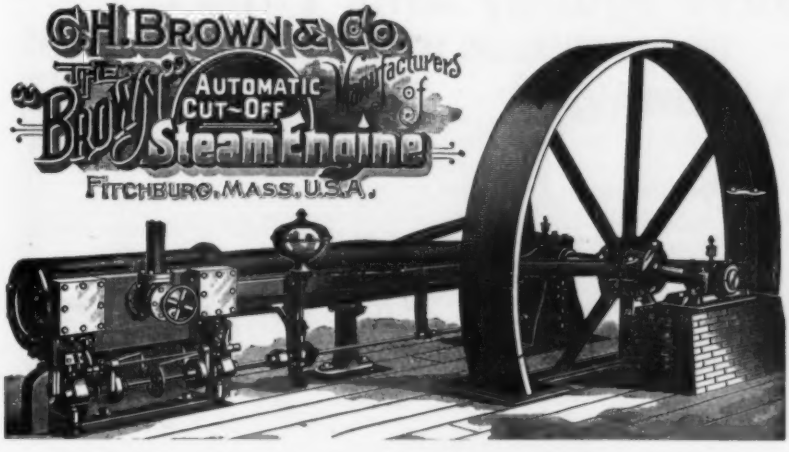

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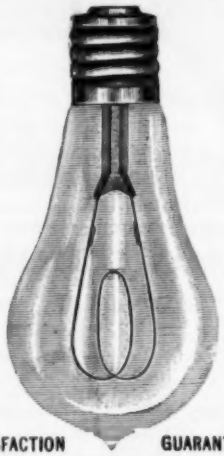

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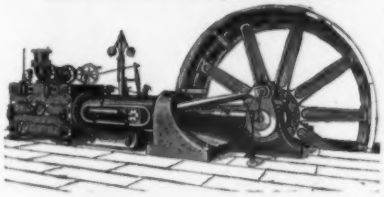

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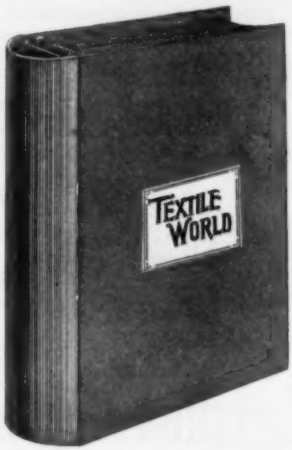

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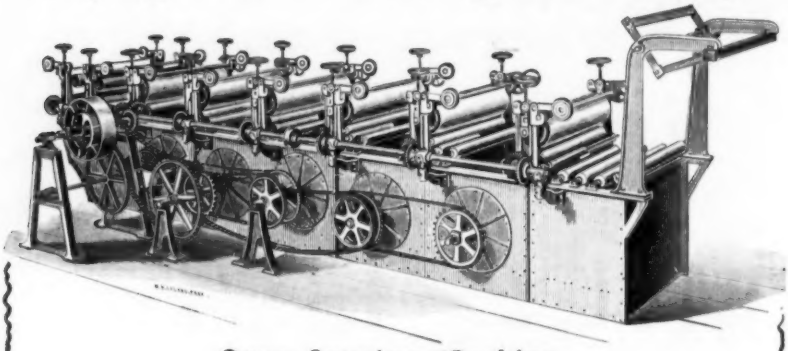

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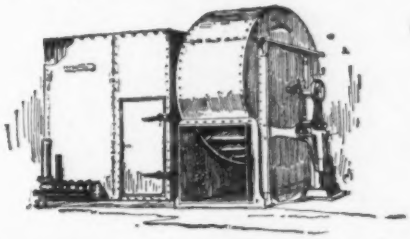

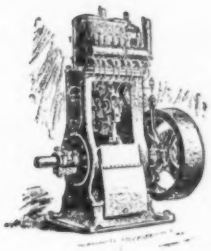

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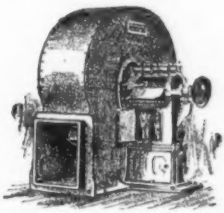

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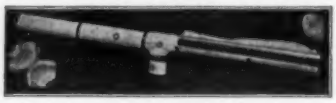
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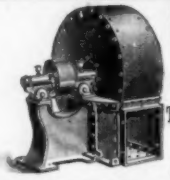
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